# EXHIBIT 9

EXHIBIT

Exhibit 124

# INDEPENDENT ENGINEER'S REPORT

# CANADIAN BREAKS WIND PROJECT

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**INDEPENDENT ENGINEER'S REPORT**

**CANADIAN BREAKS WIND PROJECT**

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leidos

June 15, 2018

Canadian Breaks LLC
c/o Macquarie Capital (USA) Inc.
115 Wild Basin Road, Suite 301
Austin, TX 78746

**Subject: Independent Engineer's Report**
**Canadian Breaks Wind Project**

Ladies and Gentlemen:

## INTRODUCTION

Presented in this report (the "Report") are the results of our review, as Independent Engineer, of the proposed Canadian Breaks Wind Project - Phase I (the "Project"), a wind energy generation facility, and certain agreements as described herein, owned by Canadian Breaks LLC (the "Owner"). The Owner is indirectly owned by Macquarie Capital (USA) Inc., ("Macquarie"). This Report has been prepared in connection with the issuance of a construction loan for and a tax equity investment in the Project ("Financial Close").

The Project is located 28 miles west of Amarillo, Texas in Oldham and Deaf Smith Counties in the Texas Panhandle, and consists of approximately 13,000 acres of leased property comprised of relatively flat terrain historically used for ranchland and agricultural purposes (the "Project Site"). The Phase II future expansion of the Project is being considered to the north and adjacent to the Project Site but is excluded from the scope of our review and this Report. The Project is considered to be in the northern part of the competitive renewable energy zone ("CREZ") in Texas, (a 345 kilovolt ("kV") CREZ transmission line runs along the eastern edge of the Project Site), which provides renewable energy generation produced in west Texas access to major transmission lines that serve major eastern Texas load areas such as Dallas, Houston, and San Antonio, among others.

The Project is being designed and constructed to utilize 87 Siemens Wind Power, Inc. ("Siemens") SW 2.3-108 wind turbine generators ("WTGs"). On April 3, 2017, Siemens and Gamesa merged to form Siemens Gamesa Renewable Energy, Inc. For purposes of this Report, Siemens Gamesa Renewable Energy, Inc. will be known as "Siemens." The Siemens SWT 2.3-108 WTG has a rated capacity of 2.3 megawatts ("MW") per WTG, providing the Project with a total installed capacity of 200.1 MW, and a maximum capacity of 2.415 MW per WTG with the addition of the "Power Boost" feature to the WTGs providing a maximum installed capacity of 210.1 MW. The renewable energy generated by the Project is to be delivered through a collection system from the WTGs to an on-site substation (the "Project Substation") to accommodate the electrical output of the Project WTGs. The Project Substation transforms the energy generated by the Project from 34.5 kV to 345 kV and, will connect via a 5.5-mile overhead 345 kV transmission line (the "345 kV Transmission Line") to the point of interconnection ("POI") at the Sharyland Utilities L.P.'s ("Sharyland") 345 kV Substation (the "Sharyland Substation") in Deaf Smith County, Texas. The Project is to interconnect to the Sharyland Substation pursuant to a standard Electric Reliability Council of Texas ("ERCOT") Generator Interconnection Agreement dated May 20, 2016 as amended by Amendment No. 1 dated December 1, 2017, Amendment No. 2 dated May 9, 2018, and Amendment No. 3 dated May 25, 2018 (the "GIA") between the Owner and Sharyland, the transmission owner and service provider. The GIA provides for the interconnection of the Project's 210.1 MW of installed capacity. A sub-synchronous resonance ("SSR") study was completed by Sharyland on March 24, 2017 based on 210.1 MW capacity of the Project, which concluded there is no potential for SSR risk and that the Project is not expected to require SSR countermeasures based on the increased output of the Project.

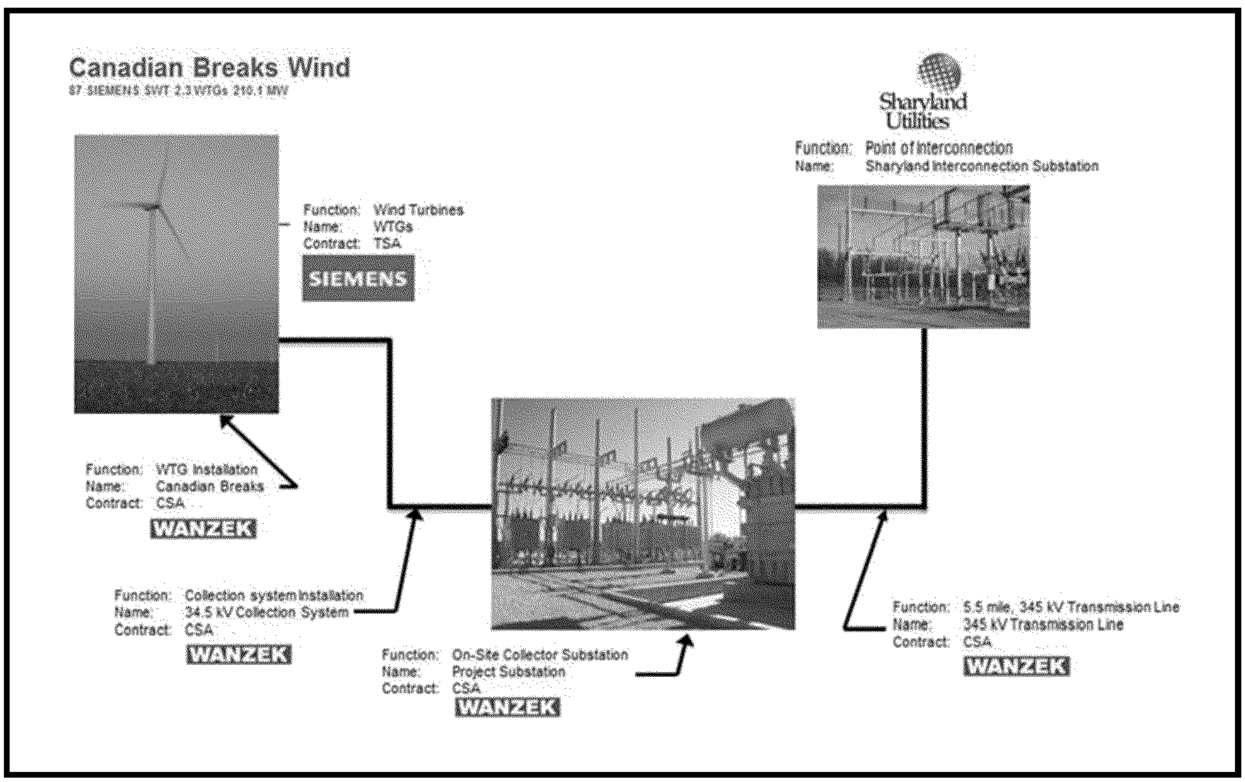
Net energy produced by the Project will be sold into the ERCOT market. To partially mitigate the variability in energy price, the Owner will enter into a hedge agreement comprised of an International Swaps and Derivatives Association ("ISDA") Master Agreement, along with the "Schedule to the Master Agreement" and other various schedules and annexes and confirmation pursuant to the draft agreements provided for our review on June 4, 2018, (collectively, the "Hedge Agreement") with JP Morgan Chase Bank, N.A. ("JPM") for the $P_{99}$ energy production to be generated by the Project. The Hedge Agreement effective date is January 1, 2020 at 0100 hours and terminates on December 31, 2032 at 2400 hours. The delivery point is at the ERCOT North Hub. The Owner reports that it plans to enter into a three-year "Basis Hedge Agreement" with JPM, similar to the draft agreement provided for our review on June 13, 2018, to mitigate the potential cost differential between the Project node at the Sharyland Substation and the ERCOT North Hub. The Basis Hedge will be for 50 percent of the $P_{99}$ energy production to be generated by the Project for the term of the agreement. Macquarie reports that it may elect to hedge the remaining 50 percent prior to the tax equity funding date of the Project. The Basis Hedge Agreement effective date is January 1, 2020 at 0100 hours and terminates on December 31, 2022 at 2400 hours. The Owner reported that the Hedge Agreement and the Basis Hedge Agreement are to be executed on the date of Financial Close and the technical requirements will be similar to the agreements provided for our review. Macquarie reported that the Owner will retain the renewable energy credits ("RECs") associated with the total net energy output of the Project and it is unknown how or to whom those will be sold.

The basic components of the Project are shown in Figure 1.

**Figure 1**

# Canadian Breaks Wind Project

## Basic Components




The engineering, procurement, and construction ("EPC") of the Project, including unloading, assembly and erection of the WTGs and the procurement and construction of the Project Substation, the 345 kV

Transmission Line, the on-site collection system, the fiber optic communications system, the operation and maintenance ("O&M") building, access roads and on-site roads, foundations, crane pads, Federal Aviation Administration ("FAA") aircraft hazard lighting for 58 WTGs, temporary FAA lights for all 87 WTGs, and two permanent met towers, will be provided pursuant to the Construction Services Agreement dated November 20, 2017 between Wanzek Construction, Inc. ("Wanzek") as the balance of plant ("BOP") contractor and the Owner (the "CSA"). Prior to execution of the CSA, the Owner issued a limited notice to proceed ("LNTP") No. 1 to Wanzek on September 16, 2016, which would subsequently be amended by change orders to the CSA on October 28, 2016 ("CSA LNTP No. 1 Change Order 1"), November 3, 2016 ("CSA LNTP No. 1 Change Order 2"), March 1, 2017 ("CSA LNTP No. 1 Change Order 3"), March 1, 2017 ("CSA LNTP No. 1 Change Order 4"), and May 15, 2017 ("CSA LNTP No. 1 Change Order 5") to perform certain preliminary EPC work that became part of the CSA upon its execution. The Owner issued CSA Change Order 1 on April 16, 2018 that provided updates to the CSA construction schedule, schedule of values, milestone schedule, the CSA price and certain turbine supply documents for the Project. The Owner issued CSA Change Order 2 on May 14, 2018 that provided further updates to the CSA construction schedule, schedule of values, milestone schedule, foundation design from 25 to 30 years, the CSA price, certain turbine supply documents for the Project and amends and restates certain CSA commercial terms. The Owner issued CSA Change Order 3 on June 6, 2018 that provided further updates to the CSA construction schedule and milestone schedule. The Owner issued CSA Change Order 4 on June 11, 2018 that provided further updates to the CSA construction schedule and milestone schedule. On February 15, 2018, the Owner issued LNTP No. 2 to Wanzek to commence with the procurement of collection system cable and for continued management of the ongoing work under the CSA for the Project. On June 6, 2018, the Owner issued LNTP No. 3 to Wanzek to commence with preparing issued for construction ("IFC") foundation drawings, civil drawings, and electrical conduit and grounding drawings as part of the ongoing work under the CSA for the Project. On June 7, 2018, the Owner issued LNTP No. 4 to Wanzek which addresses foundation rebar cancellation costs paid by the Owner to Wanzek if the Owner has not issued a full notice to proceed ("NTP") to Wanzek on or before July 16, 2018.

For the supply of all 87 WTGs to the Project, the Owner and Siemens entered into a Wind Turbine Generator and Tower Supply and Commissioning Agreement dated December 28, 2016, as amended by Scope Change Order No. 1 dated March 31, 2017, by Scope Change Order No. 2 dated May 30, 2017, by Scope Change Order No. 3 dated August 15, 2017, by Scope Change Order No. 4 dated September 29, 2017, and by Scope Change Order No. 5 dated November 16, 2017, by Scope Change Order No. 6 dated January 31, 2018, by Scope Change Order No. 7 dated February 15, 2018, by Scope Change Order No. 8 dated February 28, 2018, by Scope Change Order No. 9 dated March 8, 2018, by Scope Change Order No. 10 dated March 16, 2018, by Scope Change Order No. 11 dated April 6, 2018, by Scope Change Order No. 12 dated April 27, 2018, by Scope Change Order No. 13 dated May 15, 2018, by Scope Change Order No. 14 dated May 24, 2018, by Scope Change Order No. 15 dated June 1, 2018, and by Scope Change Order No. 16 dated June 11, 2018 (collectively, the "TSA"). Under the TSA, Siemens will supply, deliver, start-up, and commission 87 SWT 2.3-108 WTGs, each with a 108 meter ("m") diameter rotor and an 80 m hub-height. The TSA includes the WTG supervisory control and data acquisition ("SCADA") system, WTG hot-weather package, condition monitoring system, Power Boost, climb assist devices, and pre-commissioning services for the WTGs. The TSA also includes a five-year warranty whereby any defective component will be repaired or replaced at Siemens expense. The Owner reported that it will pick up the option for Siemens to supply two sets of met tower instruments. Any part repaired or replaced under this provision shall have the warranty extended by two years but no longer than two years beyond the original five-year warranty. A NTP was issued by the Owner to Siemens on September 29, 2017 instructing Siemens to proceed with the execution of the work in accordance with the TSA.

Solas Energy I LLC, as construction manager ("CM") will provide construction management and technical services for the Project during the pre-construction period and construction period of the Project pursuant to the Construction Management Agreement dated April 18, 2018 (the "CMA"). Under the CMA, the CM is to coordinate the design, EPC, commissioning, testing, and start-up of the Project for the duration of the construction period on behalf of the Owner. The term of the CMA commences on its effective date and expires upon completion of the services defined in Exhibit B of the CMA. The CM shall commence with the services under the CMA on the date of Financial Close.

The Owner entered into a Service and Maintenance Agreement with Siemens dated December 28, 2016 as amended by Amendment No. 1 dated April 6, 2018 and by Amendment No. 2 dated May 15, 2018 (collectively, the "SMA") whereby Siemens will provide service and maintenance of the WTGs, including warranty repair services of the WTGs during the five-year defect warranty period under the TSA. The SMA has a

five-year term. The Owner also entered into an "Option Agreement" dated September 29, 2017 with Siemens which grants the Owner the "Option" to convert the SMA to a Service, Maintenance, Warranty and Availability Agreement ("SMWA") by April 1, 2019. The Owner has exercised its Option and entered into the SMWA with Siemens dated May 15, 2018. The SMWA will commence upon expiration of the SMA (and the 5-year warranty under the TSA) for a term of 15 years.

BOP asset management and O&M services for the Project will be provided by E.ON Energy Services, LLC ("E.ON") pursuant to the executable version of the Asset Management Agreement (the "AMA") provided for our review on May 1, 2018 and the executable version of the O&M Agreement provided for our review on May 4, 2018 (the "OMA"), respectively. Both the AMA and the OMA have a term of 10 years with an automatic 5-year renewal term. E.ON will provide energy management services for the Project pursuant to the "Energy Services Agreement" executable version provided for our review on June 11, 2018. The Energy Services Agreement has an initial term of five years with automatic one-year renewals thereafter unless terminated by the parties. The Energy Services Agreement indicates that the Owner and E.ON will enter into an agency agreement under which E.ON will act as the qualified scheduling entity ("QSE") and the market participant agent for the Project. The Owner expects that the executable versions of the AMA, OMA, and the Energy Services Agreement that were provided for our review will be executed in their current form on the date of Financial Close.

This Report has been prepared in accordance with the Master Professional Services Agreement ("PSA") dated as of May 11, 2015 and the Task Authorization dated November 15, 2016 between Leidos Engineering, LLC ("Leidos") and the Owner. On or prior to the date hereof, Macquarie Affiliated Managers Holdings (USA) Inc., Siemens Financial Services, Inc., Coöperatieve Rabobank U.A., New York Branch, and National Australia Bank Limited, (collectively, the "Recipient Parties", entered into a use of work products agreement with Leidos outlining the terms and conditions of its use of the Report. The Report is solely for the information of and assistance to the Owner and the Recipient Parties, and should not be used for any other purpose or by any other party, except for those parties who have entered into a third-party use of work products agreement with Leidos. The Report has been developed based on the needs of the Owner and the Recipient Parties, and the level of information included reflects the knowledge of issues gained by the Owner and the Recipient Parties through the course of our review. To the extent that any other readers of the Report have not been involved over the course of our review, the information contained herein could be misunderstood or incomplete.

During the preparation of this Report, we have reviewed certain executed and draft agreements between the Owner and its contractors and suppliers (collectively, the "Project Agreements"). These Project Agreements set forth the objectives of each of the parties with respect to the design, engineering, construction, and operation of the Project. As Independent Engineer, we have made no determination as to the validity and enforceability of the Project Agreements; however, for the purposes of this Report, we have assumed that the Project Agreements will be enforceable in accordance with their terms to the extent permitted by law and that all parties will comply with the provisions of their respective agreements. For the purposes of this Report, we have assumed that all Project Agreements provided to us in draft or unexecuted form will be executed in the form provided for our review.

In addition, we have reviewed: (1) the proposed method of construction of the Project; (2) information regarding the projected level of energy production; (3) the proposed design of the Project; (4) certain reports regarding the condition of the Project Site; (5) the construction schedule prepared by others; (6) the Phase I Environmental Site Assessment ("ESA") report and the geotechnical report prepared by others; (7) the status of permits and approvals; and (8) the estimated costs of construction and O&M expenses as presented by the Owner in the spreadsheet named *"Canadian Breaks Lender Model_06142018_v2.xlsm"* received by us on June 14, 2018 (the "Pro Forma").

During the course of our review, we visited and performed general field observations of the Project Site on November 16, 2016. While on site, we observed the proposed site layouts and workspace, surrounding property, land use, meteorological ("met") equipment, site access, proposed interconnection locations and proposed rights-of-way ("ROWs") for the off-site facilities associated with the Project. The general field observations were visual, above ground examinations of selected areas which we deemed adequate to comment on the suitability of the Project Site for construction and operation of the Project, but were not in the detail which would be necessary to reveal conditions with respect to safety, the geological or environmental condition, or the conformance with agreements, codes and permits, rules or regulations of any party having jurisdiction with respect to the construction and O&M of the Project.

Certain statements included in this Report constitute forward-looking statements. The achievement of certain results or other expectations contained in such forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause actual results, performance, or achievements described in the Report to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. We do not plan to issue any updates or revisions to the forward-looking statements if or when changes to our expectations, or events, conditions or circumstances on which such statements are based, occur. No warranty, guarantee, or promise, express or implied, related to any future results, performance, or achievements associated with such forward-looking statements is provided.

## PROJECT PARTICIPANTS

Those sponsors, contractors, vendors, and other major service providers responsible for the development, design, construction, and operation of the Project are discussed below.

### Owner/Sponsor

The Owner is an indirect subsidiary of Macquarie, which in-turn is a subsidiary of the Macquarie Group, a global provider of banking, financial advisory, investment, and funds management services based in Australia. The Macquarie Group has approximately 14,300 employees worldwide and net profit of 2,063 million Australian dollars in 2016. In 2008, Macquarie acquired Fremantle Energy, a greenfield wind and solar development company in Austin, Texas. Macquarie's Austin-based team specializes in late-stage development projects in the renewable energy and energy infrastructure industries. Members of the Austin team previously developed the 161 MW Wildorado Wind Farm located in Oldham County, Texas prior to the creation of Fremantle Energy. Example projects that the Austin team has developed include: a 38 MW portfolio of solar projects in Tulare and King County, California; the 160 MW West Texas Solar 1 project in Pecos County, Texas which was sold to and constructed by OCI Solar; the 90 MW Redwood Solar Project in Kern County, California which was sold to Sustainable Power Group, LLC; the 300 MW Balko Wind farm in Beaver County, Oklahoma which was sold to D.E. Shaw Renewable Investments; the 50 MW Sparks Battery Storage project located in Irvine, California, which is currently under construction; and the 924 MW Norte III project located in Juarez, Mexico which is currently under construction. In addition to the Project, Macquarie is currently advancing the development of the 160 MW FAS 1 solar project and has completed development of and is preparing the start of construction of the 171 MW Talasa Project comprised of three separate hydroelectric facilities located in the Atrato River basin in Colombia, South America. Macquarie reports that it, and its parent company the Macquarie Group have significant experience developing, constructing and owning international utility-scale renewable projects.

### BOP Contractor

Wanzek headquartered in West Fargo, North Dakota, is a subsidiary of the MasTec Inc. ("MasTec"). MasTec is a publicly-traded communications and energy infrastructure service provider with reported gross revenues of approximately $5.1 billion in 2016. Wanzek was founded over 40 years ago, and erected its first WTGs in 2001. Wanzek reported that it has constructed over 9,000 MW of wind energy capacity, using WTGs supplied by GE, Siemens, Vestas, Suzlon, Gamesa, Mitsubishi, and Clipper. As BOP contractor, in addition to erection of WTGs, Wanzek constructs civil and electrical infrastructure for wind projects. A list of Wanzek's recent wind project experience is shown in Table 1.





**Table 1**
**Wanzek Wind Project Experience**

| Project | Location | WTG Type | MW | COD [1] |
|---|---|---|---|---|
| Twin Buttes | Colorado | Gamesa | 75.0 | 2017 |
| Fluvanna | Texas | Vestas | 151.7 | 2017 |
| Cottonwood | Nebraska | GE | 90.0 | 2017 |
| El Cabo | New Mexico | Gamesa | 298.0 | 2017 |
| Sterling | New Mexico | GE | 29.9 | 2017 |
| Courtenay | North Dakota | Vestas | 200.0 | 2016 |
| Odell | Minnesota | Vestas | 200.0 | 2016 |
| Frontier | Oklahoma | Vestas | 201.3 | 2016 |
| Prairie Breeze III | Nebraska | GE | 35.8 | 2016 |
| Tyler Bluff | Texas | Siemens | 123.1 | 2016 |
| Desert Wind | North Carolina | Gamesa | 208.0 | 2016 |
| Los Vientos IV | Texas | Vestas | 200.0 | 2016 |
| Los Vientos V | Texas | Vestas | 110.0 | 2015 |
| Thunder Spirit | North Carolina | Nordex | 102.5 | 2015 |
| Prairie Breeze II | Nebraska | GE | 73.4 | 2015 |
| Bow Lake | Ontario | GE | 57.6 | 2015 |
| Briscoe County Wind | Texas | GE | 149.9 | 2015 |
| Stephens Ranch – Phase 2 | Texas | GE | 164.7 | 2015 |
| Los Vientos III | Texas | Vestas | 200.0 | 2015 |
| Lundgren | Iowa | Siemens | 246.1 | 2014 |
| Bison 4 | North Dakota | Siemens | 204.8 | 2014 |
| Stephens Ranch – Phase 1 | Texas | GE | 200.6 | 2014 |
| Spring Canyon III | Colorado | GE | 28.9 | 2014 |
| Spring Canyon II | Colorado | GE | 32.3 | 2014 |
| Vienna II | Iowa | Siemens | 43.7 | 2013 |
| Lakeswind | Minnesota | GE | 51.2 | 2013 |
| Spinning Spur Wind Ranch | Texas | Siemens | 161.0 | 2013 |
| Los Vientos Wind – 1A | Texas | Siemens | 200.0 | 2013 |
| Santa Isabel | Puerto Rico | Siemens | 101.2 | 2013 |
| Busch Ranch | Colorado | Vestas | 28.8 | 2013 |
| Morninglight Windfarm | Iowa | Siemens | 101.2 | 2013 |
| Crofton Bluffs | Nebraska | Vestas | 42.0 | 2013 |
| Eclipse Wind MEC | Iowa | Siemens | 200.0 | 2013 |
| Huerfano River | Colorado | Sany | 8.0 | 2013 |
| Meadow Creek Wind | Idaho | Suzlon | 119.7 | 2013 |

(1) Commercial Operation Date ("COD").

**Wind Turbine Manufacturer/Service, Maintenance and Warranty Provider**

Siemens entered the wind turbine market with its acquisition of Bonus Energy A/S ("Bonus") in 2004. Siemens Wind Power is headquartered in Denmark and has manufacturing and assembly facilities primarily in Denmark and the United States ("U.S."). At the time of the acquisition, Bonus was a well-established manufacturer that had been manufacturing wind turbines since 1980. Bonus/Siemens has been involved in the wind industry for more than 25 years and is a leading WTG supplier with over 36,500 MW reported to be installed worldwide at year-end 2016. Siemens ranked fifth among other WTG suppliers with over 3,400 MW installed globally in 2016. The accumulated installed capacity of Siemens WTGs is presented, along with the installed capacity of other current major WTG manufacturers, in Table 2.

**Table 2**
**Accumulated Global Installed Capacity by Manufacturer Through 2016 (1)**

| Manufacturer (2) | 2013 MW | 2014 MW | 2015 MW | 2016 MW | Percent of Total | 2016 MW Installations |
|---|---|---|---|---|---|---|
| Vestas | 58,133 | 63,403 | 71,155 | 79,846 | 16.3 | 8,691 |
| GE | 39,900 | 45,307 | 51,714 | 58,846 | 12.0 | 7,133 |
| Enercon | 31,181 | 35,274 | 38,287 | 41,606 | 8.5 | 3,318 |
| Gamesa | 27,493 | 29,697 | 33,381 | 37,779 | 7.7 | 4,398 |
| Goldwind | 19,238 | 24,028 | 30,936 | 37,361 | 7.6 | 6,425 |
| Siemens | 22,916 | 28,473 | 33,077 | 36,521 | 7.5 | 3,444 |
| Nordex Group | 13,241 | 15,055 | 17,740 | 20,825 | 4.2 | 3,085 |
| Sinovel | 15,316 | 16,135 | 16,515 | 16,785 | 3.4 | 270 |
| Suzlon | 13,917 | 14,995 | 15,497 | 16,641 | 3.4 | 1,144 |
| United Power | 8,784 | 11,385 | 14,449 | 16,351 | 3.3 | 1,902 |
| Other Manufacturers | 70,116 | 88,709 | 111,112 | 127,490 | 26.0 | 16,377 |
| Total | 320,235 | 372,459 | 433,863 | 490,049 | 100.0 | 56,186 |

(1) Source: Make Consulting A/S.
(2) In decreasing order by accumulated total capacity in MW through 2016.

Siemens participation in the U.S. market has recently grown. Siemens' manufacturing is primarily located in Denmark but it has expanded its manufacturing capabilities in other wind markets, including the U.S. Many of the Siemens' WTG components are produced in-house, including the rotor blades. In 2007, Siemens established a blade-manufacturing plant in Fort Madison, Iowa and, in December 2010, a new nacelle assembly plant was opened in Hutchinson, Kansas to support its activities in the U.S. market. Siemens also owns the largest WTG gearbox manufacturer, Winergy. On April 3, 2017, Siemens Wind Power and Gamesa merged to form Siemens Gamesa Renewable Energy, Inc. The Owner informed us that the exact sourcing for of the WTG components for the Project has not been finalized; however, the blades are to be manufactured in Fort Madison, Iowa, towers will be manufactured by Korindo in Indonesia, and Winergy gearboxes will be used in all WTGs. Siemens Corporation is to provide a parent company guarantee under the TSA and Siemens Gamesa Renewable Energy, S.A. is to provide a parent company guarantee under both the SMA and the SMWA.

## Construction Manager

Solas Energy I LLC is part of the Solas Energy Consulting Group (collectively with Solas Energy I, LLC, "Solas"), which has offices in Fort Collins, Colorado and Calgary, Alberta Canada. The Solas Canadian office was established in 2009 and the U.S. office was established in 2010. Solas provides business strategy, business consulting, construction management and commercial advisory services in the renewable energy industry. Typical construction management services in the renewable energy industry include project management support, managing and overseeing the construction contractors, field engineering, scheduling, change order management, performing QA/QC inspections, providing monthly reports, management of lender requirements, among other services. A representative list of recent projects that Solas has provided construction management services are included in Table 3. Solas reported that of the projects listed in Table 3, the scope of services for construction management was similar to its construction management scope for the Project.

**Table 3**
**Solas Wind Construction Management Experience**

| Name | Location | Capacity (MW) | Completed |
|---|---|---|---|
| Sunflower Wind | North Dakota | 104 | 2017 |
| Bingham Wind/Blue Sky West | Maine | 184.8 | 2017 |
| Hancock Wind | Maine | 51 | 2017 |
| South Plains II | Texas | 300 | 2017 |
| Oakfield Wind | Maine | 147.6 | 2017 |

**Operator/Asset Manager**

E.ON is a subsidiary of E.ON Climate & Renewables North America ("ECRNA"), a renewable energy company headquartered in Chicago, Illinois with approximately 300 U.S. employees. ECRNA's wind headquarters is in Austin, Texas. ECRNA is a subsidiary of E.ON Climate & Renewables ("EC&R") of Essen, Germany. EC&R is a subsidiary of E.ON SE, an international investor-owned utility based in Germany. E.ON operates and maintains more than 3,200 WTGs totaling approximately 6,400 MW of wind generation in the U.S. Services offered by E.ON include project administration, full-service maintenance, energy management services, spare parts procurement, remote monitoring, and scheduled and unscheduled maintenance. E.ON provides remote monitoring and diagnostics for U.S. projects from its Renewables Operations Center ("ROC") located in Austin, Texas. A representative list of wind projects for which E.ON has been providing O&M, asset management, and energy scheduling/dispatch services for more than five years is included in Table 4. In addition to the projects listed in Table 4, E.ON is providing these services for 17 additional wind projects in the U.S. which came online since 2013.

**Table 4**
**E.ON Wind O&M Experience**

| Name | Location | Capacity (MW) | Commencement Year |
|---|---|---|---|
| Forest Creek | Texas | 124.2 | 2007 |
| Munnsville | Texas | 34.5 | 2007 |
| Sand Bluff | Texas | 90.0 | 2008 |
| Roscoe | Texas | 209.0 | 2008 |
| Champion | Texas | 126.5 | 2008 |
| Pyron | Texas | 249.0 | 2009 |
| Inadale | Texas | 197.0 | 2009 |
| Panther Creek III | Texas | 115.5 | 2009 |
| Settlers Trail | Illinois | 150.4 | 2012 |
| Pioneer Trail | Illinois | 150.4 | 2012 |
| Magic Valley | Texas | 203.3 | 2012 |
| Panther Creek I | Texas | 142.5 | 2013 |
| Panther Creek II | Texas | 115.5 | 2013 |
| Papalote Creek I | Texas | 179.5 | 2013 |
| Papalote Creek II | Texas | 200.1 | 2013 |
| Stony Creek | Pennsylvania | 52.5 | 2013 |
| Wildcat I | Indiana | 200.0 | 2013 |

**Summary**

Based on our review, we are of the opinion that Wanzek, as BOP contractor, Solas Energy I, LLC, as construction manager, and Siemens, as WTG supplier, have previously demonstrated the capability to construct wind facilities of similar size and technology as the Project, and Siemens, as WTG service provider, and E.ON, as

asset manager, operator, and energy services provider, have previously demonstrated the capability to operate and manage wind facilities of similar size and technology as the Project.

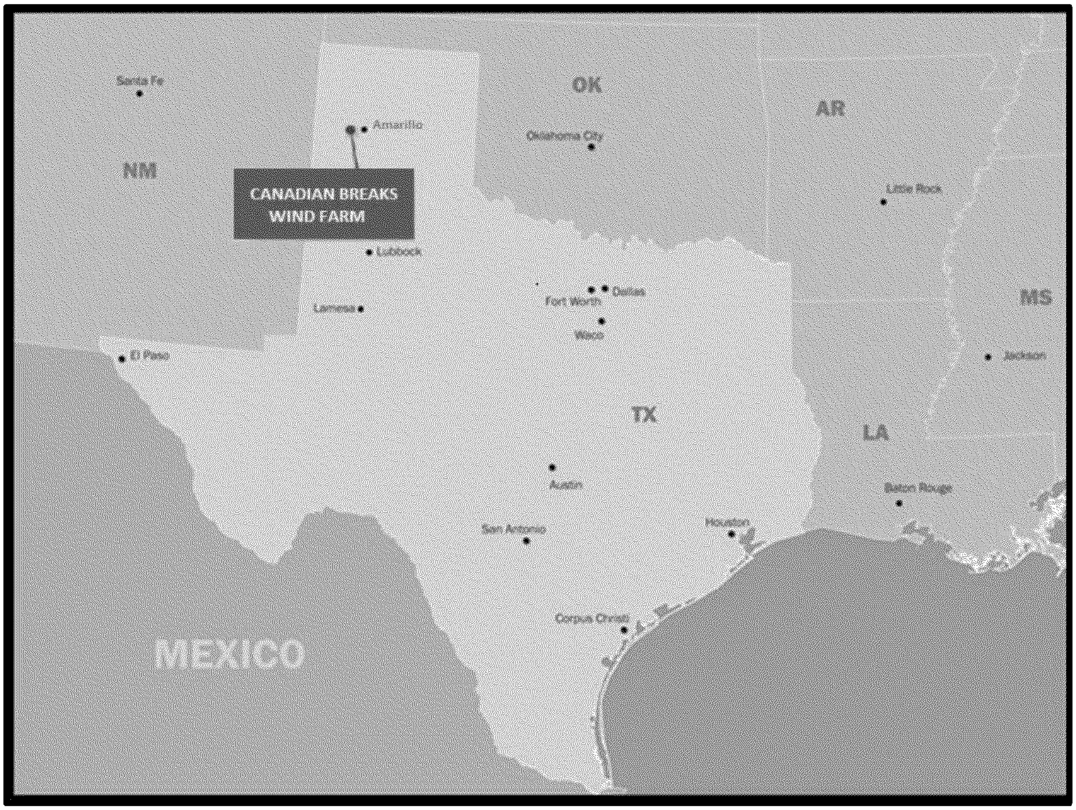
### THE FACILITY SITE

The Project is located, as shown in Figure 2, in Oldham and Deaf Smith Counties, Texas, approximately 28 miles west of Amarillo, Texas and 270 miles west of Oklahoma City, Oklahoma.

**Figure 2**

# Canadian Breaks Wind Project

## Project Site Location




**Site Conditions**

The Project Site consists of approximately 13,000 acres of leased property located south of Interstate Highway 40 ("I-40") that is comprised of flat terrain, which has historically been used for agricultural purposes and cattle grazing.

The Project Site is comprised of 12 tracts that are under signed land leases with the landowners. The leases include a development period with the earliest expiration date of August 12, 2020 and a primary term of 25 years which begins on the date of commercial operation of the tract pursuant to the land lease. The leases can be extended by the Owner for two subsequent 10-year terms thereafter. The Owner has executed natural gas pipeline crossing agreements with AgriTex Gas, Wildorado Gas, and Nustar Energy for the crossing of access roads and collections lines. In addition, a crossing agreement with Windstream has been executed for the crossing of an existing fiber optic line by the access roads and collection lines, and a crossing agreement with Deaf Smith Electric Coop has also been executed. The Project Substation will be located in Oldham County and the wind lease for the tract includes the Project Substation. The O&M building will be located in Oldham County near the center of the Project Site on property leased from the landowner as part of the wind lease. County road use has been granted to the Owner pursuant to resolutions and orders issued by Oldham County dated January 9, 2017 (the "Oldham County Road Use Agreement") and Deaf Smith County dated January 23, 2017 (the "Deaf Smith County Road Use Agreement"). The Owner has also received road crossing permits from Oldham County dated November 13, 2017 for underground or overhead crossing of Oldham County Roads. The Owner has executed two 200-foot wide transmission line easements for the construction, access, operations, and maintenance of the 345 kV Transmission Line which is approximately 2 miles in length from south of the Project Site to the POI. The term of the easements are each 25 years following their effective date of the easements, and can be extended for two subsequent 10-year terms thereafter.

Elevations within the Project Site range between approximately 1,183 meters above sea level ("masl') to approximately 1,223 masl.

The Federal Emergency Management Agency ("FEMA") has not mapped the portions of Oldham and Deaf Counties which include the Project Site. The Facility Site is not located in a FEMA flood plain.

Highway access to the Project Site is convenient via I-40 to the north, and various local roads. The Project Substation and the O&M building will be accessed from County Road 44 to the Project Access Road F.

**Subsurface Conditions**

Subsurface investigations were performed at the Project Site during the periods of August 5, 2016 through September 10, 2016 by Terracon Consultants, Inc. of Oklahoma City, Oklahoma ("Terracon"). Based on the subsurface investigations, Terracon prepared the subsurface investigation reports titled "*Geotechnical Engineering Report, Canadian Breaks Wind Farm Near Vega, Oldham and Deaf Smith Counties, Texas,*" dated December 16, 2016 and "*Geotechnical Engineering Report, O&M Building, Canadian Breaks Wind Farm Near Vega, Oldham and Deaf Smith Counties, Texas,*" dated October 17, 2016 (together the "Geotechnical Report").

The subsurface investigations included: (1) a review of existing geological information; (2) an exploration of soil, and groundwater by means of soil borings; (3) laboratory tests to aid the classification of the soils and the selection of engineering parameters; (4) geophysical testing by means of Multi-Channel Analysis of Surface Waves ("MASW") to derive a one-dimensional shear wave profile; and (5) preparation of the Geotechnical Report. The Geotechnical Report includes a summary of the field investigations, exploration location plan and boring logs, and the results of field and laboratory tests. Based on the subsurface investigation and test data, the Geotechnical Report provides general construction recommendations for the design of the WTG foundations, substation foundations and O&M Building foundations. Additionally, the Geotechnical Report provides the results of the laboratory resistivity testing for use in determining corrosion potential for buried metals. The Geotechnical Report also presents results of chloride and sulfate testing that can be used by the foundation engineer to draw conclusions about the corrosion potential of the soils at some of the boring locations.

The Geotechnical Report included soil borings at all 87 proposed WTG locations to a maximum depth of approximately 60 feet below ground surface ("bgs"), 2 borings at the proposed substation locations to a depth of 40 feet bgs and two borings at the O&M building to a depth of 15 feet bgs. The general subsurface profile includes inter-bedded layer of lean clays, fat clays and calcareous lean clays with varying amounts of sand. Bedrock when encountered was a hard cemented, calcareous material referred to as caliche which was encountered at depth from the ground surface to the depth explored. The soft clay soils were encountered within 0 feet to 13 feet bgs. The lean to fat clays encountered have a high potential for swelling and shrinkage. Terracon noted for the lean to fat clays, due to the weight of the WTG foundation and the depth, the shrink and swell is not expected to have a detrimental impact on the WTG foundations, however, these materials are not acceptable for use as fill materials for foundation supporting structures. The caliche material, when encountered during excavation for foundations, will require heavy excavation equipment.

Additionally, the Geotechnical Report reports that groundwater was not encountered during subsurface exploration. Terracon also provides well data from the Texas Water Development Board in the vicinity of the Project Site, which indicate ground water elevations from 180 feet bgs to 240 feet bgs. Terracon noted that buoyancy does not need to be considered for the design of the WTG foundations.

Based on the results of the subsurface investigations, Terracon indicates that the subsurface is generally considered suitable for the support of, gravity-type foundations supported by the on-site subgrade materials. The majority of the WTG sites with firm or still on-site soils at foundation bearing at 9 feet below existing grade are to be designed with a net allowable bearing pressure of 3,000 pounds per square foot ("psf"). For a number of WTG foundations, a greater embedment depth is recommended due to soils encountered at the proposed bearing elevation that are not suitable for a net allowable bearing capacity of 3,000 psf. Terracon recommends the foundation bearing depth be increased to at least 12 feet below the existing grade at nine WTG locations, a bearing capacity of 3,000 psf with a bearing depth of 13 feet bgs at two WTG locations, a bearing capacity of 2,500 psf with a bearing depth of 12 feet bgs at two WTG locations, and a bearing capacity of 2,500 psf with a bearing depth of 9 feet bgs at two locations. As an

alternative to increasing the bearing depth of the WTG foundations, the soils below the 9-foot bearing depth may be excavated and replaced with a lean concrete mix or compacted backfill.

In the Geotechnical Report, Terracon provides recommendations for certain relevant engineering parameters (e.g., the bearing capacity, the coefficient of sliding friction, and backfill density) required for the design of such foundations. The parameters that are associated with the determination of subgrade stiffness, (e.g., shear modulus and modulus of elasticity of the soils) are included in the Geotechnical Report. Additionally, a recommended value for Poisson's ratio is included.

Based on the use of the recommended bearing capacity, an assumed 54 foot-6-inch foundation width, and assumed applied loads, which we note are in the range of the loads provided by the WTG supplier, Terracon indicates that estimated total settlement of the WTG foundations is expected to be less than 2 inches, for normal operating conditions. Terracon notes the differential settlement is estimated to be within the allowable limit of 3 millimeters per meter.

The Geotechnical Report includes recommendations with respect to both the site classification and the spectral accelerations to be used for seismic design. Based on the provisions of the 2012 International Building Code ("IBC"), the Geotechnical Report indicates that a Site Class equal to "D" (corresponding to a stiff soil profile) is applicable for the Project Site. Further, the Geotechnical Report provides estimates of the mapped spectral response accelerations of S = 0.157 times the acceleration due to gravity ("g") and $S_1$ = 0.045 g; these spectral acceleration values generally correspond to an area with a moderate level of seismic activity.

Further, the Geotechnical Report provides recommended soils properties and bearing strengths (and other necessary parameters), and soil improvements that could be used for the design of the Project Substation and the O&M building. Terracon notes that shallow foundations may be supported on native soils, however, if low-strength soils are encountered, over-excavation to a depth of 8 inches below the bearing depth and replacement with compacted structural fill materials is recommended. The recommended minimum depth for frost protection is 30 inches below final grade or the replacement of the on-site soils with non-frost susceptible materials. Terracon recommends that floor slabs of the O&M building be supported on 1 foot of a cohesive soil with low potential for expansion. For substation structures with heavy axial loads or large overturning moments, the Geotechnical Report indicates that deep foundation systems (consisting of drilled piers) could be used to support these items. Further, the Geotechnical Report provides recommended soils properties and bearing strengths (and other necessary parameters) that could be used for the design of substation foundation systems.

The Owner reported that the thermal resistivity results included in the Geotechnical Report were determined to have anomalies due to careless handling and storage of the soils samples. Wanzek requested that Barr Engineering Company ("Barr") of Minneapolis, Minnesota collect soil samples for thermal resistivity testing at 12 locations at the Project Site, which occurred on December 12, 2016. The test results were included in the report titled "*Soil Thermal Resistivity Testing Results – revision 2 Canadian Breaks Wind Project Oldham and Deaf Smith Counties, Texas*" dated February 17, 2017 and said results were used for the electrical design of the Project.

The Geotechnical Report provides recommendations for site preparation, structural fill and use of on-site materials for fill. Terracon provides detailed recommendations for the use of the various on-site soils for foundation backfill about the WTG foundations, backfill below the WTG foundation, access road subgrade, and trench backfill. The Geotechnical Report provides recommendations for construction of site access roads, including depth of aggregate base. Terracon recommends the use of Type I cement for all below grade concrete based on a test result for water soluble sulfates. Terracon also notes the near soils have moderately corrosive to severely corrosive characteristics and notes cathodic protection for buried metal pipe can be utilized for corrosion protection.

Under the terms of the CSA, the risk of concealed physical conditions, which could not have been reasonably foreseen with appropriate due diligence, and differ materially from the CSA or differ materially from the nature of construction activities in the geographic location of the Project Site remains with the Owner. If such conditions are encountered, Wanzek is allowed a change in scope and price associated with the change. The CSA includes standard language which allows for a change with regard to unknown pre-existing hazardous materials encountered during construction.

**Nearby Development**

There are three operational wind power projects located in the immediate vicinity of the Project Site. The Spinning Spur project is located approximately 6.4 kilometers ("km") to the northwest of the Project Site and consists of 35 SWT 2.3-101 WTGs and 35 SWT 2.3-108 WTGs. The Wildorado Wind project is located approximately 6.4 km northeast of the Project Site and consists of 70 SWT 2.3-93 WTGs. The Golden Spread Panhandle project is approximately 3.2 km northeast of the Project Site and consists of 34 SWT 2.3-101 WTGs. There are no other known wind power projects operating, under construction, or under development in the near vicinity of the Project Site. Wake effects from the Spinning Spur, Wildorado, and Golden Spread Panhandle projects have been taken into consideration in the "Energy Production Report, Independent Wind Resource and Energy Assessment for the Proposed Canadian Breaks Wind Project" report prepared by AWS Truepower LLC, a UL Company, dated May 31, 2018 (the "AWS Energy Assessment"). The energy loss due to wake impacts of the nearby projects was estimated by AWS to be 0.5 percent. Based on our review, we find that the AWS Energy Assessment methodology appropriately addresses the energy loss due to wake impacts from nearby projects identified therein on the Project WTGs based on the current WTG site arrangement.

While there are several additional existing wind farms located further to the north, south, and southwest of the Project Site that are not specifically discussed in the AWS Energy Assessment, they are more than 50 rotor diameters in distance from the Project Site, which is the common industry standard for inclusion in an energy assessment. In addition, any potential decrease in wind speed due to waking from these projects would be inherently incorporated into the on-site wind speed measurements collected by the on-site met towers. The Project Site is also sufficiently distant from these projects that any measured decrease in wind speed would be negligible and within the uncertainty limits of wind speed measurements and wake modeling.

Canadian Breaks II, LLC, an affiliate of the Owner, is a potential developer of a wind project on land which it owns to the north of the Project Site with space for approximately 100 MW of wind generation. The Owner has a draft "Build-Out Agreement" provided to us on March 29, 2018 that it intends to execute in order to set forth the rights, obligations and restrictions of the parties or any subsequent party with respect to wind interference effect (reduced Project output), transmission effect (local transmission curtailment), O&M effect (O&M costs or savings as a result of shared facilities, spare parts, and otherwise conducting operations and maintenance and sharing employees), and land rights as a result of a wind farm being constructed on the adjacent land. The Build-Out Agreement specifies that the wind interference effect, transmission effect, and O&M effect would be analyzed and determined by an independent party and paid for by the developer or each subsequent party. Results of this analysis are to be used to develop a revised model that will determine a lump sum cash adjustment payable to the Project or an affected party if the revised model shows that the date in which the Project will realize an after tax IRR equal to its target IRR ("Flip Date") will not occur on or prior to the anticipated Flip Date solely as a result of the wind interference effect, transmission effect, and the O&M effect. Further, if a wind project is developed by a subsequent party, the Build-Out Agreement requires the subsequent party to enter into a co-tenancy or other common facilities agreement with respect to the land rights. Since the Canadian Breaks II, LLC wind project has not been developed, it is not included in the AWS Energy Assessment.

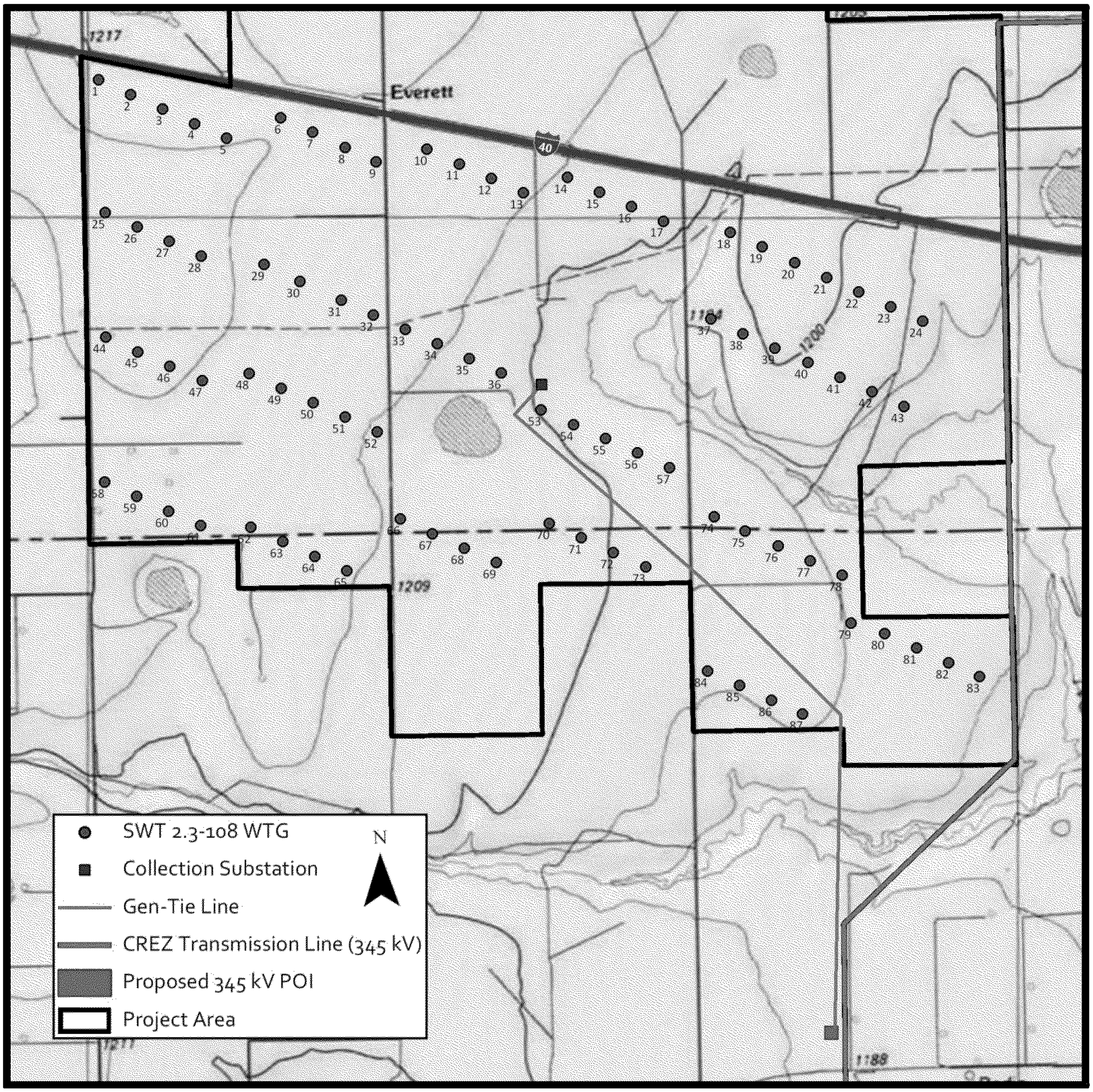
**Site Arrangement**

The WTG layout at the Project is shown in Figure 3. The 87 WTGs with a hub-height of 80 m are arranged in rows generally oriented from northwest to southeast. Each row generally includes 4 WTGs and one row has 8 WTGs. The average proposed WTG ground elevation is 1,206 masl and the proposed WTG locations cover a range in elevation from approximately 1,183 masl to 1,223 masl. Average WTG spacing is about 3.5 rotor diameters (378 m) with a minimum inter-turbine spacing of 3.4 rotor diameters (366 m), which is consistent with industry standard minimums. The impact of WTG spacing on turbulence and mechanical loading is typically included in the WTG manufacturer's evaluation of the suitability of the WTG model to the Project Site and is discussed later in this Report. The impact of WTG spacing on energy losses due to wakes is included in AWS Energy Assessment.

**Figure 3**

# Canadian Breaks Wind Project

**Turbine Arrangement**




Source: Layout courtesy of the Owner.

**Summary**

Based on our review, we are of the opinion that the Geotechnical Report provides information and recommendations that should be sufficient to support the design of the WTG foundations and which is consistent with current wind industry practice. Further, provided that the Owner and Wanzek follow the recommendations made by Terracon in the Geotechnical Report regarding subsurface conditions and foundations during design and construction of

the Project, the Project Site should be suitable, from an infrastructure and geotechnical perspective, for construction, operation and maintenance of the Project.

Based on our review of the equipment arrangement layout, the Project Site is of adequate size to support the construction, operation and maintenance of the Project, and provides sufficient access for transportation of equipment and the transmission of the generated electricity to the POI.

## THE FACILITY

### Civil and Structural

#### On-Site Roads

The design and construction of roadways will encompass three distinct tasks: (1) provision of the on-site road network; (2) modifications of access to the site road system to facilitate the turning of WTG equipment; and (3) improvements to public and/or private roads to facilitate the transport and delivery of WTG equipment.

Site access roadways will be constructed from the existing state and county roads to the WTG locations. The on-site access roadways and modifications to the applicable off-site roadways are specified in the CSA to be a 16 feet wide with 10-foot compact earthen shoulder when required for crane movement. The CSA does not specify the width of the crane paths, however, we note the 60 percent civil design (the "preliminary access road drawings") indicate crane paths be provided with a width of 36 feet, which is similar in width to other wind projects with which we are familiar. The preliminary access road drawings specify a road width of 16 feet with cross-slope or crown of 2 percent and 10-foot shoulders when required for the crane path, and a width of 36 feet for the crane path with a 2 percent crown or cross-slope. The preliminary access road drawings provide details for the minimum turning radii of the access roads, slope requirements of the access road and crane paths, and details of widening of intersections.

Further, the CSA indicates that Wanzek is required to perform maintenance of access roadways and public roads as required pursuant to resolutions and orders issued under the Oldham County Road Use Agreement and the Deaf Smith County Road Use Agreement, and applicable laws throughout the construction period, with the exception of damage or deterioration caused by the Owner, the WTG supplier or other third parties. The road use agreements include improvements to the public roads and maintenance to the public roads during the construction of the Project. The CSA requires Wanzek to reclaim disturbed areas at the completion of WTG construction. Restoration includes providing proper drainage to areas graded, repair and regrading of private graveled access roads to pre-construction conditions and re-seeding as required by the landowner provisions and permits. Additionally, aggregate from the laydown areas is to be re-claimed and installed on roads or stockpiled and the soil is to be decompacted.

Each of the WTGs is located within its own area within the Project Site. The preliminary access road drawing provides a typical laydown area with a radius of 150 feet with an additional 50-foot diameter with minimal clearing for stockpiling of topsoil with minor disturbance. The laydown area is to be graded with a maximum slope of 2 percent and compacted per the requirement of the WTG supplier and axle loading requirements of the equipment. A crane pad is to be constructed in the laydown area with dimension of approximately 60 feet by 80 feet. In accordance with the TSA, Siemens will be provided with the design for the roads and installation areas, as prepared by Wanzek. The specifications for the design and construction of the on-site roads, off-site access roads and off-site intersection improvements are generally consistent with the requirements for WTG transport enumerated in the TSA, and consistent with accepted industry practice for roadway design.

#### WTG Foundations

The type of foundation used in the design is the gravity-type, comprising a large diameter, cast-in-place, reinforced concrete mat. Following completion of the base mat, with the threaded anchor rods or bolts embedded, the circular upper pier, or pedestal, is formed and the concrete is placed. After backfill and compaction are completed and upon the achievement of sufficient strength in the concrete, the tower base section is set and grouted. Subsequently, the threaded anchor rods are post-tensioned to the designed level.

**Mechanical Systems**

The SWT 2.3-108 WTG is a three-bladed, horizontal axis, variable-speed, full-span pitch control WTG, which is typical of most modern utility-scale WTGs. The variable-pitch rotor allows for adjustment of the blade operating angle to optimize wind energy capture and to provide a primary mode of braking for the rotor. The blade pitch is also used to regulate maximum power production. The rotor is attached to a nacelle mounted on a tubular steel tower. The rotor consists of three blades oriented upwind of the tower, an internal hydraulically driven pitch system for each blade, and a hub. Wind sensors are mounted on top of the nacelle. The nacelle contains the main shaft, three-stage gearbox, asynchronous generator, mechanical brake, active yaw components, and controllers. A lightning protection system is integrated into the blades, hub, nacelle, tower, and foundation of the WTG assembly. The nacelle and tower are completely enclosed and contain all the necessary components and operating systems for each WTG to function independently. The tower includes access ladders, platforms, internal lighting and safety equipment, and is secured to a concrete foundation utilizing a double ring of anchor bolts. The WTG specifications are summarized in Table 5.

**Table 5**
**Siemens SWT 2.3-108 Summary Specifications**

| | |
|---|---|
| Rated Power | 2,300 kW (1) |
| Hub-Height | 80 m |
| Rotor Diameter | 108 m |
| Rated Wind Speed | 10 m/s (2) |
| Cut-In Wind Speed | 4 m/s |
| Cut-Out Wind Speed | 25 m/s |
| Gearbox Manufacturer | Winergy |
| Blade Manufacturer | Siemens |
| Generator Manufacturer | ABB, Siemens, Loher |

(1) Kilowatts (“kW”).
(2) Meters per second (“m/s”).

Siemens offers a variety of options and packages for the SWT 2.3-108 WTG. The following options were selected for the Project:

- Climb Assist: a mechanical hoist system which assists technicians as they climb the internal ladders of the tower (standard).
- WebWPS: Siemens’ SCADA system that allows for remote control, monitoring, and reporting from a standard Internet web browser.
- Siemens Turbine Condition Monitoring System: monitors the vibration level of the gearbox, generator, and main shaft bearings. Observed vibration levels are compared with a set of pre-established reference criteria and the WTG is shut down if deviations are detected.
- Hot Weather Package: Siemens’ Hot Weather package increases the temperature range the WTG can operate in. Increased ventilation and white painted surfaces (rather than grey) reduce heat buildup in the hot weather version.
- Vortex Generators (“VGs”) and “DinoTails”: VGs are small vertical fins attached to blade surface which act to decrease flow separation from the blade and can improve aerodynamic efficiency of the blade. DinoTails, also known as serrated trailing edges, are bonded to the trailing edge and primarily act to reduce aerodynamic noise, although Siemens claims the DinoTails also improve performance. The Revision 2 power curve for the SWT 2.3-108 WTG includes the benefits of both of these aerodynamic features.
- Power Boost: The Siemens Power Boost function increases the rated power of the WTGs by 5 percent for wind speeds up to approximately 16 m/s, increasing overall energy production. The increase in power output is achieved by increasing the rotational speed of the rotor, but maintains constant torque. This preserves the level of loading, but increases the number of cycles contributing to fatigue. Siemens has considered the impact of implementing Power Boost at the Project in the Siemens report titled *“Climatic Conditions Review, Canadian Breaks Wind Farm,”* dated September 28, 2016, (the “Siemens Site Suitability

Report") and determined that all WTGs at the Project can be equipped with the Power Boost feature without exceeding the 20-year design fatigue loads. Siemens has stated that approximately 90 percent of the SWT 2.3-108 WTGs globally are running with the Power Boost feature.

## Electrical Systems

### Electrical Collection System

The collection system for the Project is to be made up of seven collector circuits. Each circuit includes strings of WTGs with the strings of each circuit terminated on an associated circuit breaker in the Project Substation. There are to be five to nine WTGs on a circuit. The collection system circuits for the Project are each to be constructed underground using three 34.5 kV single aluminum conductor cables with tree retardant cross-linked polyethylene insulation and polyethylene jacket which connect groups of WTG units to an open air isolation switch on the 34.5 kV collector bus in the Project Substation. The feeder cables are to be direct buried, with strings of WTGs in a given circuit connected in junction cabinets. Fault indicators are to be located at the incoming terminals of the junction cabinets and as indicated on the Project drawings such that there are no more than three WTG between fault indicators. Underground splices are to be allowed where the distance between WTG or the last WTG to the Project Substation exceeds the available length of cable on a reel or in instances where cable is installed in conduit further than 300 feet from the end of a cable run. Splices are to be made with splice kits and installed in accordance with the manufacturer's instructions by personnel who have received training by the manufacturer. The location of each splice is to be identified in the field with a marker ball and the global positioning system data for its location included in the Project record documents. Where required, the cables may be run in directionally bored high-density polyethylene ("HDPE") conduits to cross roads, pipelines, or waterways. Crossing under state highways and railroad ROWS are to made using a bored steel casing with HDPE conduits inserted to carry the cables. Cables from the WTG tower pass through the WTG foundation in conduit to a pad-mount transformer rated 2.7 megavolt-ampere ("MVA") to raise the voltage from 690 volt ("V") to 34.5 kV. The WTGs are to be connected in a loop-fed configuration using dead-break elbows to connect to the bushings in the pad-mount transformer. Surge arrestors are to be installed at the end of each branch of a string of WTGs and at the cable risers in the Project Substation. A continuous ground conductor and fiber optic communications conductors for control of the WTGs are to be installed with the collector system power conductors.

Electrical system losses include the 34.5 kV collector system losses, including the WTG pad-mount transformers, the generator step-up transformer ("GSU") no-load, load and auxiliary losses, and transmission line losses up to the POI. The loss study dated March 22, 2017 prepared for the Project by Mott McDonald USA, LLC, as Wanzek's electrical engineer indicates electrical system losses of 1.76 percent on an annual energy basis. The total annual average electrical energy losses represented in the $P_{50}$ energy projection included in the AWS Energy Assessment are 2.1 percent, which is higher than the losses reported in the loss study.

### On-Site Substation

The collection system is to supply power to the Project Substation. The Project Substation is to step up the voltage to 345 kV for interconnection to the Sharyland transmission system. The Project Substation is to include five 34.5 kV branch circuit breakers in combination with open air-type isolation switches to connect the collection system feeders to the 34.5 kV main substation bus. The branch circuit breakers are to include integral high-speed grounding switches to isolate and protect the remaining two phases from overvoltage conditions in the event of a single line to ground fault. An additional 34.5 kV circuit breaker with a bus side isolation switch is to be connected to the main bus to connect three 13 megavolt-amperes reactive ("MVAr") switched capacitor banks required for reactive power compensation. The main bus is to be connected to a nominal 34.5-345 kV, wye-delta-wye GSU rated 235 MVA with two stages of forced air cooling in operation through a 34.5 kV open air isolation switch and a 34.5 kV circuit breaker. The GSU is to include an on-load tap changer. The GSU is to be connected to the 345 kV Transmission Line through a 345 kV transformer circuit breaker and a motor-operated line disconnect switch. The Project Substation is to also include protective relay and metering equipment, telemetry to transfer electrical quantity and status data to Sharyland, and a station service transformer connected to the main substation 34.5 kV bus to provide power to the O&M building and the Project Substation station service loads. Back-up station service power is to be provided from a local utility distribution feeder connected to the main substation bus using an automatic transfer scheme.

**Electrical Interconnection**

The power output from the Project Substation is intended to flow through the 345 kV motor-operated line disconnect switch located at the Project Substation and the 345 kV Transmission Line to the POI located at the Sharyland Substation. The output of the Project is to be connected to the Sharyland transmission grid through the Sharyland Substation, which is to be constructed by Sharyland, and is to be configured in a breaker and a half scheme initially including three breakers between two busses designed for expansion to interconnect future wind generating plants. The Sharyland Substation is also to include line disconnect and circuit breaker isolation switches, surge arresters, and instrument transformers for revenue metering and protective relaying. The POI of the interconnection facilities is where the conductors from the 345 kV Transmission Line terminate on the Sharyland dead end structure in the Sharyland Substation. The Sharyland Substation is to include facilities to and interconnect to the existing 345 kV transmission line between the Sharyland AJ Swope and Windmill Substations.

## Control Systems

The control and monitoring system is to be comprised of four separate, but related systems: (1) a WTG controller at each WTG; (2) the Siemens "NetConverter;" (3) the Siemens "WebWPS" SCADA system; and (4) the substation and utility interface SCADA control system. These systems are all connected together through a fiber optic network and hardwired communications system.

Each WTG is equipped with a Siemens-supplied WTC 3 WTG control system. The control system is microprocessor-based and provides control and monitoring of the WTG including yaw, speed, hydraulic systems, equipment temperatures, generator current and voltage. The controller automatically starts and stops the WTG in response to wind conditions and adjusts power generation and power factor through voltage control during operation. The control unit is capable of producing and displaying data for operating and production data reports, and operations and alarm logs. Information from the control system is transmitted to the O&M building over a buried fiber optic link installed with the collection system. The WTG controller is capable of autonomous operation in the event of loss of communication with the SCADA system.

In addition, the controls for each WTG will also be integrated with the Siemens' NetConverter power conversion system. This allows the generator to operate at variable speed, frequency and voltage while the NetConverter delivers power to the collector system at constant frequency and voltage. In addition, the system provides low-voltage ride-through ("LVRT") under fault conditions.

The SCADA system planned for the Project is the Siemens WebWPS SCADA system. The SCADA system provides remote monitoring and control capabilities for the individual WTGs, archives WTG operational data, and generates performance reports on a WTG-specific or project-wide basis. It also receives data from the Project Substation through the grid monitoring system ("GMS") panel and the met towers. The WebWPS SCADA system allows authorized users web-based access to data files and reports, facilitating multiple-party access to the data.

There is to be a separate substation and utility interface SCADA system(s) dedicated to substation protection and Sharyland and ERCOT requirements. This SCADA system is intended to exchange metering and equipment status data at the Project Substation with Sharyland and ERCOT and to transfer trip the Project Substation 345 kV circuit breaker as required by the GIA. Information to/from the Project Substation and utility interface SCADA system can be provided to the WebWPS SCADA System through the fiber optic/CAT5e network.

# CONSTRUCTION OF THE FACILITY

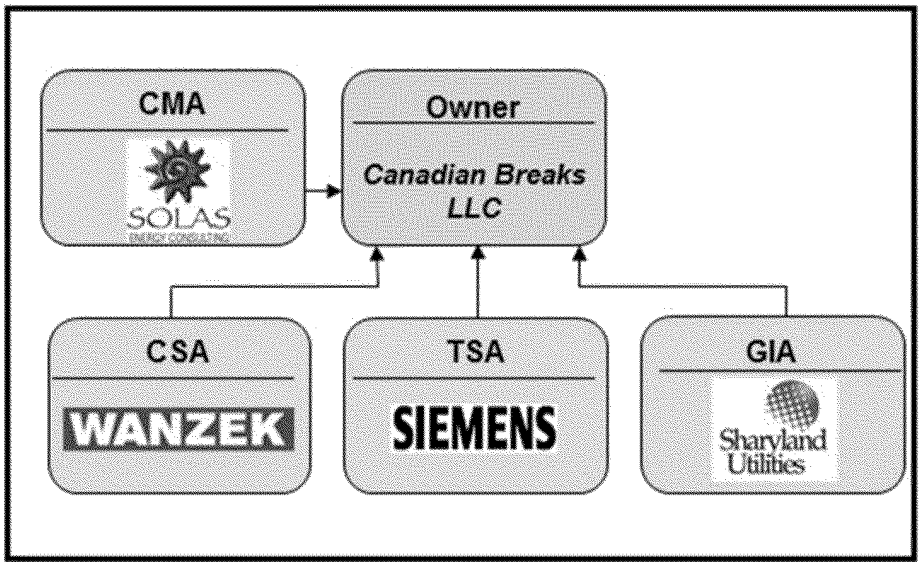
## Construction Arrangements

The EPC of the Project is to be performed under the CSA, the TSA, and the GIA using a structure as shown in Figure 4.

**Figure 4**

# Canadian Breaks Wind Project

## Project Structure During Construction




**Overview**

Under the TSA, Siemens is to supply, deliver, start-up and commission 87 SWT 2.3-108 WTGs with 108 m diameter rotors and 80 m hub-height structural towers. Siemens is required to deliver the WTGs to the Project Site. The TSA includes 80 m towers, transportation, commissioning, SCADA system and interface, WTG hot-weather package, condition monitoring system, five-year equipment defect warranty, Power Boost, climb assist, pre-commissioning and final commissioning of 87 WTGs including generators, and two months of storage cost. The TSA also includes provisions for early delivery and storage before the WTG locations are ready for delivery to each pad and schedule guarantees associated with WTG delivery, commissioning, substantial and final completion, and a power curve warranty. Siemens is to provide technical field assistance to support the unloading, erection, installation, and mechanical completion of the WTGs and SCADA by Wanzek. The Owner retains the option to perform a power curve performance test. The Owner reported that it will pick up the option for Siemens to supply two sets of met tower instruments. Major Owner obligations include: paying the contract price of approximately $128,804,500 (the "TSA Contract Price"); erection of the WTGs (or causing them to be erected); completing all BOP work (or causing it to be completed); providing Siemens access to the Site, each WTG, and the SCADA system; complete all communication lines necessary for the SCADA system; achieving permanent grid energization and provide a sufficient power supply to perform the commissioning of the WTGs; and obtaining applicable insurance and permits. NTP was issued to Siemens on September 29, 2017 which instructs Siemens to proceed with the work in accordance with the TSA. Initial spare parts for the WTGs during the operating period, as recommended by Siemens under the TSA at a cost of $1,066,932, is to be purchased by the Owner.

Under the CSA, Wanzek will: (1) design, engineer, procure, and construct the equipment provided under the CSA, civil works, access roads, crane travel paths, crane pads, electrical collection system, two permanent met towers including installation of the met tower instruments supplied by Siemens (and remove the two existing temporary met towers), and the fiber optic communications system; (2) prepare the site and construct the foundations (for 30-year design life) for the installation of the WTGs; (3) receive the WTGs and SCADA system from Siemens, and unload, wash, and install the WTGs, install 87 temporary FAA lights for all WTGs, and install 58 permanent WTG FAA lights; (4) design, engineer, procure, and construct the Project Substation and the 345 kV Transmission Line; (5) procure and construct the O&M building; (6) provide construction period insurance; and (7) pay sales and use taxes





imposed on Wanzek for the work under the CSA. Wanzek will furnish all the supplies, materials, equipment, machinery, tools, supervision, and labor that are required to perform the CSA work. Under the CSA, the Owner is obligated to provide access to the Project Site, cause Siemens to supply and deliver the WTGs to the Project Site, cause Siemens to commission the WTGs upon Wanzek achieving mechanical completion, provide builder's all-risk insurance during the construction period, and provide other owner-supplied equipment as required under the CSA. Prior to execution of the CSA, the Owner issued LNTP No. 1 to Wanzek, which was subsequently amended by CSA LNTP No. 1 Change Order 1, CSA LNTP No. 1 Change Order 2, CSA LNTP No. 1 Change Order 3, CSA LNTP No. 1 Change Order 4, and CSA LNTP No. 1 Change Order 5 to perform certain preliminary EPC work valued at $609,591 that became part of the CSA upon its execution. After the execution of the CSA, the Owner also issued CSA Change Order 1 that provides updates to the CSA construction schedule, schedule of values, milestone schedule, the CSA price and certain TSA documents which are attached as exhibits to the CSA, and a $1,600,000 performance bond by Wanzek at a cost of $48,000. The Owner further issued CSA Change Order 2 that provides further updates to the CSA construction schedule, schedule of values, milestone schedule, foundation design from 25 to 30 years, the CSA price, certain turbine supply documents attached as exhibits to the CSA for the Project and amends and restates certain CSA commercial terms at a cost of $99,892. The Owner also issued CSA Change Orders 3 and 4 that provides further updates to the CSA construction schedule and milestone schedule, but no change in contract price. The Owner expects to issue a full NTP to Wanzek by June 15, 2018. If the full NTP has not been provided to Wanzek by June 15, 2018, Wanzek will be entitled to an equitable adjustment to the CSA guaranteed completion dates, construction schedule, and the CSA price pursuant to a change order to the CSA. Should the Owner fail to issue a full NTP by July 22, 2018, Wanzek can terminate the CSA. The Owner issued LNTP No. 2 to Wanzek to commence with the procurement of collection system cable and for continued management of the ongoing work under the CSA valued at $170,000, which is included as part of the CSA price. The Owner issued LNTP No. 3 to Wanzek to commence with preparing IFC foundation drawings, civil drawings, and electrical conduit and grounding drawings as part of the ongoing work under the CSA valued at $75,000, which is included as part of the CSA price. The Owner issued LNTP No. 4 to Wanzek which addresses foundation rebar cancellation costs of $650,000 paid by the Owner to Wanzek if the Owner has not issued the full NTP to Wanzek on or before July 16, 2018.

The Owner will pay Wanzek the CSA price (inclusive of CSA Change Order 1, CSA Change Order 2, CSA Change Order 3, CSA Change Order 4 and taxes paid on taxable Project equipment furnished by Wanzek) of $53,728,701 (the "CSA Price"), in accordance with the progress against the schedule of values provided with the CSA. Within 10 business days after the Owner delivers to Wanzek a full NTP, the Owner will pay Wanzek 20 percent of the CSA Price (less any previous payments made by the Owner) as deposit, which will be allocated against all subsequent payment requests. The Owner is permitted to withhold 5 percent retainage from each payment to be made to Wanzek. Upon achievement of substantial completion, the retainage amount is released to Wanzek, less an amount equal to 150 percent of the estimated cost of completing the punchlist items, until such time as each punchlist item is completed. Wanzek may engage subcontractors as necessary to perform the work provided any subcontract value greater than $100,000 be deemed a major subcontractor and be selected from the approved subcontractors list provided in Exhibit A.05 of the CSA.

The GIA provides for the construction of interconnection facilities and the interconnection of up to 210.1 MW of capacity to the Sharyland 345 kV transmission system based on 87 - 2.415 MW WTGs. Under the terms of the GIA, the interconnection facilities to be constructed generally consist of the customer's interconnection facilities, comprised of the Project Substation and the 345 kV Transmission Line, and the transmission owner's interconnection facilities ("TIF"), which include the interconnection bay and associated equipment at the Sharyland Substation. Sharyland will construct, operate, and maintain the facilities in the Sharyland Substation and other system equipment required for the transmission of energy from the Project. All interconnection studies to allow the Project to interconnect with the transmission system have been completed. The Owner is to design, procure, construct, own, and install its interconnection facilities. The Owner is to build, own, and operate the Project Substation on the Project Site, as well as the approximate 5.5-mile long 345 kV Transmission Line from the Project Substation to the Sharyland dead end structure at the Sharyland Substation. The facilities include revenue metering at the Sharyland Substation, telemetry, communications and system protection equipment as specified in the GIA. The parties are to exchange information on the design of their facilities and mutually agree upon the design and compatibility of each party's facilities.

Under the CMA, the CM will manage the implementation and administration of the BOP contract, the TSA and ensure that Wanzek and Siemens comply with the real property documents through final completion of the Project, on behalf of the Owner. The administration of lease payments and notices to the landowners will be undertaken by the Owner and E.ON, acting as asset manager, pursuant to the AMA. The term of the CMA expires upon the completion of services defined in Exhibit B of the CMA. The CM's responsibilities include, but are not limited to reviewing drawings, specifications and technical documentation; conducting project review meetings; providing overall oversight of site construction, including management of construction progress against budgeted costs and schedule; reviewing and recommending approval of invoices and change orders; administrative support; contract monitoring; reviewing and accepting completed work; providing permitting support; quality control and inspections; witnessing start-up and performance testing; and providing weekly progress reports; and providing Project close-out services.

The CM is to be reimbursed for all direct and indirect home office expenses through a fixed management fee of $1,841,000 (the "Management Fee"), which is to be paid over a 17-month term, inclusive of 14 months on-site field work pursuant to Exhibit G to the CMA. Should the on-site field work extend beyond 13 months, the CM and Owner agree to negotiate in good faith adjustments to the amount and timing for the payment of the Management Fee. The fees are not subject to escalation. Either CM or Owner may terminate the CMA for reasons not limited to failure of payments, breach of obligations, foreclosure, dissolution, contract termination, bankruptcy and force majeure events in excess of six months. The Owner may terminate the CMA without any liability (except for any payments authorized under any LNTPs issued by the Owner to the CM) if the date of Financial Close has not occurred by July 31, 2018, or for convenience upon 30 days prior written notice to the CM. If the CMA is terminated by the Owner for convenience, it shall pay the CM any unpaid management fees, plus expenses directly resulting from such termination, minus any undisputed payments owed by the CM to the Owner. In the event the Owner elects to terminate the CMA due to CM default, the CM is obligated to compensate the Owner the costs in finding replacement construction management services. The CM is to cooperate with the Owner for the transfer of responsibilities to the new service provider.

The Owner will construct, own, operate and be responsible for the costs to maintain, repair, and replace the customer's interconnection facilities. The POI is the point at which the 345 kV Transmission Line conductors terminate on the Sharyland dead end structure located inside the Sharyland Substation. The Sharyland Substation is connected to a 345 kV transmission line that runs between Sharyland's AJ Swope and Windmill Substations. The GIA does not provide for any services other than the interconnection of the Project to the Sharyland transmission system.

**Completion Process**

The CSA contains seven completion milestones. The completion milestones consist of: (1) road completion (includes completion of turning radii from public roads); (2) foundation completion for each WTG foundation (includes submission by Wanzek of a punchlist to the Owner); (3) mechanical completion for each WTG (includes WTG assembly and installation (including tower), the WTG is ready to be energized and to commence commissioning by Siemens and Wanzek has submitted a punchlist to the Owner); (4) collection circuit completion (with respect to each collection circuit, includes completion of construction, energization (or capability of being energized), and testing required to connect each WTG in the circuit to Sharyland's transmission system (including capability of providing backfeed power), including completion of the associated portions of the fiber optic system, and Wanzek has submitted a punchlist to the Owner); (5) high-voltage completion (includes completion of the Project Substation, 345 kV Transmission Line, and interconnecting facilities, and such are energized or capable of being energized and able to deliver electrical power produced by the project, including capability of providing backfeed power), and Wanzek has submitted a punchlist to the Owner); (6) substantial completion (includes road completion, foundation completion for all WTGs, mechanical completion for all WTGs, collection system completion for all collection circuits, high-voltage completion, a final punchlist has been submitted by Wanzek to the Owner, draft copies of job book, operating manual, as-built documentation, and quality assurance documentation has been delivered to the Owner, but excluding completion of punchlist items; and (7) final completion. Each milestone shall have been deemed complete when the requirements of each milestone have been achieved and certified by Wanzek and confirmed by the Owner as identified in the CSA.

The Owner reported that it made a down payment of $2,000,000 to Siemens on or before December 30, 2016. The remaining balance of TSA Contract Price will be paid to Siemens in accordance with the following payment schedule:

- First Progress Payment: 20 percent less down payment due upon the date of Financial Close, but no later than June 15, 2018.
- Second Progress Payment: 20 percent 60 days after the First Progress Payment.
- Spare Parts Payment: $1,066,932 30 days after delivery of spare parts to site.
- Ready to Ship Payment: 50 percent (pro rata per WTG) due the later of (a) 30 days after receipt of the ready to ship invoice and (b) 5 business days after delivery of the nacelle.
- Unit Commissioning Completion Payment: 5 percent (pro rata per WTG).
- Final Commissioning Completion Payment: 5 percent upon unit commissioning completion of the last WTG unit.

Siemens will deliver WTGs to the Owner as early as January 4, 2019 and complete delivery by March 20, 2019. Siemens will perform pre-commissioning of all WTGs during the period of March 11, 2019 through May 18, 2019, will perform standstill maintenance of the WTGs during the period of April 15, 2019 through June 29, 2019, and will perform final commissioning of all WTGs during the period of July 1, 2019 through August 5, 2019 based on a guaranteed backfeed power date by the Owner of June 29, 2019. Anticipated final completion (including punchlist completion) and site demobilization of Siemens personnel is August 9, 2019. Siemens is obligated to pay liquidated damages ("LDs") for delays in achieving guaranteed delivery dates and final completion date as discussed below under the "Guarantees and Liquidated Damages" section of this Report. The TSA includes wind and weather delay criteria with respect to any start-up, inspection or commissioning activities associated with the WTGs. When wind speeds are in excess of the benchmarks set forth in the TSA, certain work is delayed until wind conditions subside and return to at or below benchmark levels.

Under Exhibit B "Time Schedule" to the GIA (the "GIA Time Schedule"), the Owner is to provide security in the aggregate amount of $13,180,000, which is equal to the estimated cost of the Sharyland interconnection facilities. The Owner is to post $100,000 by March 13, 2018 for Sharyland to proceed with siting of the POI (Project confirmation received that this was paid on March 13, 2018), deliver Owner NTP to Sharyland with engineering, design, and procurement of long-lead equipment for the TIF by May 25, 2018 and make payment of $822,600 in two parts - $350,000 on or before May 25, 2018 and $472,600 by June 8, 2018 (Project confirmation received that Owner delivered NTP to Sharyland with an effective date of May 25, 2018, made payment to Sharyland of $350,000 prior to May 25, 2018, and made payment to Sharyland of $472,600 prior to June 8, 2018), post $6,985,400 by June 29, 2018 for Sharyland to proceed with procurement of the TIF (11.5 months prior to the in-service date of the transmission facilities ("ISD")), and post $5,272,000 by August 31, 2018 for Sharyland to commence with construction of the TIF (9.5 months prior to the ISD). Exhibit B indicates a milestone date for the ISD as June 14, 2019. Sharyland can suspend its performance of activities in the development and construction of the TIF at any time if the applicable security has not been provided by the Owner. The security amount is to be returned by Sharyland upon the Project achieving commercial operation. The GIA includes a provision that allows up to two additional generating projects to be connected to the Sharyland Substation. In the event that such additional projects are added prior to the return of the security posted by the Owner, the security amount is to be adjusted on a pro-rata basis between the Project and the additional projects. If the Project does not achieve commercial operation by one year after the scheduled COD of September 13, 2019, or COD as set forth in a revised GIA Time Schedule, or if the Owner terminates the GIA, Sharyland may retain as much of the security as needed to cover its cost of planning and constructing its interconnection facilities. The GIA Time Schedule currently includes a milestone date for scheduled trial operation date of the Project of June 21, 2019.

**Guarantees and Liquidated Damages**

Wanzek would guarantee that it will perform the work such that mechanical completion under the CSA is achieved for each WTG no later than the applicable CSA guaranteed mechanical completion date as set forth in Exhibit C.01 to the CSA. Wanzek would be subject to delay LDs for failure to meet the CSA guaranteed mechanical completion date designated for each WTG in an amount equal to $1,000 per day of delay per WTG that has not yet achieved mechanical completion, up to the 15th day of delay, and $1,500 per day of delay per WTG for each day thereafter until such mechanical completion has been achieved.

Wanzek would guarantee that it will perform the work such that collection circuit completion under the CSA is achieved for each collection circuit no later than the applicable CSA guaranteed collection circuit completion

date as set forth in Exhibit C.01 to the CSA. Wanzek would be subject to delay LDs for failure to meet the applicable CSA guaranteed collection circuit completion date in an amount equal to $4,000 per day of delay per collection circuit, until such collection circuit completion has been achieved.

Wanzek would guarantee that it will perform the work such that high-voltage completion under the CSA is achieved no later than the CSA guaranteed high-voltage completion date as set forth in Exhibit C.01 to the CSA. Wanzek would be subject to delay LDs for failure to meet the CSA high-voltage completion date in an amount equal to $10,000 per day of delay, up to the 15th day of delay, and $25,000 per day of delay for each day thereafter, until high-voltage completion has been achieved.

Wanzek would guarantee that it will perform the work such that substantial completion under the CSA is achieved no later than the CSA guaranteed substantial completion date as set forth in Exhibit C.01 to the CSA. Wanzek would be subject to delay LDs for failure to meet the CSA guaranteed substantial completion date in an amount equal to $15,000 per day of delay, up to the 15th day of delay, increasing to $30,000 per day of delay up to the 45th day of delay, and $45,000 per day of delay for each day thereafter, until substantial completion has been achieved.

Wanzek's liability for delay LDs under the CSA shall not exceed 20 percent of the CSA Price. Furthermore, should Wanzek fail to achieve multiple milestones simultaneously, LDs accrual shall not be cumulative between certain milestones, that is, only the greater of LDs payable under failure to achieve on time performance of mechanical completion, collection circuit completion, and substantial completion shall apply at any particular time. The Owner reports that the performance bond of $1,600,000 that the Owner has proposed that Wanzek provide has been sized to cover the interest during construction that would be owed over a 90-day period. A delay of more than 90 days in achieving substantial completion would result in a Wanzek event of default under the CSA.

Wanzek's aggregate liability arising out of the CSA would be 100 percent of the CSA Price. Wanzek shall retain risk of loss of the WTGs and WTG foundations until mechanical completion is achieved for each such WTG, and for the remainder of the work Wanzek shall retain risk of loss of the work until the completion for that portion of the work is achieved, at such time risk of loss will transfer to the Owner. The Owner reports that MasTec is to provide a parent company guarantee for the obligations of Wanzek under the CSA, which shall be delivered to the Owner concurrently with the Owner providing the NTP to Wanzek.

The TSA includes schedule guarantees with associated LDs related to WTG delivery, commissioning, and substantial completion, as discussed below.

- Siemens is subject to delay LDs for failure to meet guaranteed WTG delivery dates at a rate of $1,500 per WTG per day for "Major Components" defined as blades, hub, nacelle, power unit, and tower. Siemens is also subject to delay LDs of $1,500 per WTG per day for items other than Major Components required called, "Minor Components."
- Siemens is subject to delay LDs for failure to meet the substantial completion as defined under the TSA "Guaranteed Unit Operation Date" at a rate of $1,500 per WTG per day.

Maximum liability for delivery delay LDs is 20 percent of the TSA Contract Price. Siemens is not liable for LDs if the Owner has not completed connection to the interconnection point. Siemens Corporation is to provide a parent company guarantee for the obligations of Siemens under the TSA.

The TSA includes a power curve guarantee with associated LDs. A power curve verification test option is included and must be completed within 180 days after final completion of the last WTG at the expense of the Owner. If power curve testing is to be performed, the TSA specifies that three WTGs shall be tested. The power curve guarantee is to be tested by calculating the mean energy production from the product of the measured power curve of WTGs tested multiplied by the "Nominal Wind Distribution" for the Project Site, which is included in the TSA documentation as Exhibit S3 (the "Measured Annual Energy Production"), and then averaged over all the tested WTGs for the Project. The result must not be less than the annual energy production calculated as the product of the "Contract Power Curve" (Exhibit S2 dated February 6, 2017) multiplied by the Nominal Wind Distribution for the Project Site, minus the uncertainty of the test. If the power curve test is below the guaranteed power curve, Siemens has 30 days after receipt of the written power curve test results to notify the Owner of its intent to attempt to correct the underperformance and retest. Siemens has 365 days after notifying the Owner of its intent to retest to complete repairs

and retest. If the WTG meets the performance guarantee after such modifications or adjustments after re-testing, then Siemens will make the same changes to all WTGs displaying the same behavior as applicable. Additional and more comprehensive power curve testing criteria are referenced in the Siemens document *"Machine Power Performance Test."* The power curve warranty and testing procedure will allow identification of grossly underperforming WTGs, although the terms of the power performance warranty will allow minor levels of underperformance to not require remedy under the warranty. Such minor underperformance is accounted for in the AWS Energy Assessment. Siemens is liable for LDs for power curve underperformance if the initial power curve test does not meet the guaranteed power curve of $300 per WTG for each one percent on a pro rata basis. This LD is calculated for the period of time between the initial power curve test and the retest, at which time if the measured power curve falls below the guaranteed power curve, LDs of $70,000 per WTG for every 1 percent of underperformance on a pro rata basis are triggered. These LDs are limited to 20 percent of the TSA Contract Price.

Based on our knowledge of the Siemens "G2 Platform," we believe the risk that the Project WTGs will not meet their sales power curve is low to moderate. A prototype of the SWT 2.3-108 was subjected to a power performance test as part of the "Type Certification" process. In addition, with over 2,000 SWT 2.3-108 units operating, and over 7,000 G2 WTGs operating, many performance tests have been performed on this platform and this model. We are not aware of any power performance issues with the SWT 2.3-108 or any of the WTG models in the G2 Platform.

Siemens guarantees WTG availability of not less than 94 percent during the first year of operation and 97 percent thereafter. Failure to meet these availabilities will result in LDs of $8,000 per WTG for each 1 percent on a pro rata basis of underperformance. Total LDs under the availability provision shall not exceed 20 percent of the TSA Contract Price.

The TSA also has provisions where Siemens is not liable for LDs if certain requirements under the TSA and exhibits have not been adhered to. Total LDs for availability and energy production due to power curve underperformance are limited to 25 percent of the TSA Contract Price.

The TSA includes a sound guarantee of 107 decibels A-weighted ("dBA"). The sound level guarantee under the TSA applies only during the five-year warranty period. A sound level test provision calls for conducting the test, at the Owner's expense, within 120 days of final commissioning. If the test does not meet the guarantee, Siemens can correct and at its expense, retest. This correction and retesting is to continue until the sound guarantee is met, at which time similar corrections shall be made by Siemens at its expense to other WTGs so that the sound guarantee is met.

Maximum LDs for the combination of delivery dates, commissioning dates, availability and power curve underperformance is 30 percent of the TSA Contract Price. Maximum liability for all claims related to the TSA is equal to 100 percent of the total TSA Contract Price. Siemens is liable for LDs under the TSA for a period of 12 months after expiration of the 5-year warranty period.

The TSA and CSA contain common force majeure, default, and termination provisions for agreements of this type. The TSA also provides for termination for convenience by the Owner, but requires that the Owner pay termination charges in accordance with the termination schedule, Exhibit A3, of the TSA. For the avoidance of doubt, if the Owner terminates the TSA for convenience, the Owner shall pay Siemens a termination fee equal to the following: 40 percent of TSA Contract Price on or prior to Financial Close but no later than June 15, 2018 less the down payment of $2,000,000 previously paid by Owner to Siemens; 80 percent of TSA Contract Price 60 days after the first progress payment is due less previous payment made; and 100 percent of TSA Contract Price on the ready to ship notice of the first nacelle less previous payment made. Siemens keeps title to all WTG components not shipped to the Project Site upon receipt of such notice of termination. The Owner may terminate the TSA for cause should Siemens be in breach of its obligations under the TSA after a five-day written notice. Siemens shall be entitled to a fair increase in contract price after 182 days of an extended force majeure event.

**Warranty**

Wanzek will warrant that: (1) the material and equipment provided under the CSA work will be new, unused, and undamaged when installed, free from defects, and conform with the requirements of the CSA and applicable laws and standards; (2) the services provided will be performed with Wanzek's skill and judgment consistent with

prudent electrical industry practices and in a good and workmanlike manner, and will conform with applicable laws and prudent industry practices; (3) the completed work will perform as intended as a complete integrated operating system (excluding the WTGs which are covered under the TSA warranty); and (4) none of the work may violate any intellectual property rights. The term of the warranty is generally for a period of two years from the date of substantial completion. These warranty provisions are typical for wind power industry agreements of this type.

The TSA includes a five-year warranty whereby any defective component will be repaired or replaced at Siemens expense. Any part repaired or replaced under this provision shall have the warranty extended by two years but no longer than two years beyond the original five-year warranty. A services warranty of the WTGs supplied under the TSA is covered under the SMA, which is discussed under the "Operating Agreements" section of this Report. Warranty of the 87 WTGs supplied under the TSA commences at contract starting date (i.e., December 28, 2016) and expires at the earlier of: (1) 5 years from commissioning of the last WTG; or (2) 66 months after delivery of the last Major WTG component. Siemens warrants both parts and installation practices, as well as any re-performed service or repaired or replacement part furnished under the warranty, which shall carry warranties on the same terms as set forth above.

The TSA for the 87 WTGs includes a serial defect warranty, which is triggered if the same defect occurs in the same part or component in 15 percent or more of the WTGs. If the serial defect warranty is triggered, Siemens must perform a root-cause analysis ("RCA") and provide the owner a written report of its findings. Siemens shall, at its option, repair and/or replace the defective part or re-perform the services and notify the owner the estimated time to correct the serial defect. The warranty of the serial defective component will be extended the longer of either: two years from the date of such repair or replacement; or (2) no more than two years past the original warranty period expiration date.

**Summary**

Based on our review, we are of the opinion that the aggregate of the TSA and the CSA provide the facilities and services required for the construction of the Project, and the GIA provides for the interconnection of the Project to the ERCOT transmission system.

## Capital Costs

We reviewed the construction costs estimated by the Project and presented in the Pro Forma. The capital costs are comprised of the construction costs and the other Project costs. The construction costs for the Project include both the direct costs to construct the Project and indirect costs associated with the contracting and construction of the Project. "Direct Construction Costs" include the direct labor, material and equipment costs such as the work covered under the TSA and CSA, the work required for construction of the electrical interconnection, and similar items. "Indirect Construction Costs" include items such as engineering, project management, start-up management and similar costs. The total construction cost for the Project (excluding the expected interconnection facilities costs) of approximately $189,422,862 (the "Total Construction Cost") and the estimated total project costs for the Project of approximately $246,999,440 (the "Total Project Cost"), which is comprised of the Total Construction Cost plus the other project costs and finance costs, are summarized in Table 6 and discussed in the following sections.

**Table 6**
**Total Project Cost (1)**
**($000)**

| | |
|---|---|
| Direct Construction Costs | |
| TSA Construction Costs | 128,003 |
| BOP Construction Costs | 53,729 |
| Interconnection Facilities Cost | - |
| Total Direct Costs | 181,732 |
| Indirect Construction Costs | |
| Owner's Engineering | - |
| Construction Management, Owner's Eng'g, OMA/AMA Fees | 2,408 |
| Start-Up Costs and Spare Parts | - |
| Total Indirect Costs | 2,408 |
| Subtotal Construction Costs | 184,140 |
| Construction Contingency | 5,283 |
| Total Construction Costs | 189,423 |
| Other Project Costs | |
| Turbine Sales and Use Tax | 130 |
| Post Construction ALTA Survey | 50 |
| Insurance | 272 |
| Title Insurance | 575 |
| Interconnection and Hedge Agreements Security Cost | 1,388 |
| Development Costs and Fees | 28,367 |
| SMA Upfront Payment | 7,316 |
| Landowner Payments | 1,388 |
| Total Other Costs | 39,486 |
| Financing Costs | |
| Interest During Construction and Commitment Fees | 4,231 |
| Tax Equity Fees and Legal | 4,359 |
| Construction Financing Upfront Fees | 1,657 |
| Transaction Costs | 7,844 |
| Total Financing Costs | 18,091 |
| Total Project Costs | 246,999 |

(1) As estimated by the Owner.

**Construction Costs**

The estimated Total Construction Costs of $189,422,862 is comprised of the direct and indirect construction costs and contingency as discussed below, and excludes the other costs and finance costs discussed later herein.

***TSA Construction Costs***

The turbine supply cost of approximately $128,003,432 includes the TSA Contract Price of $128,804,500, spare parts package for the five-year TSA warranty of $1,066,932, $132,000 for two sets of met mast instruments, and a credit of $2,000,000 for a down payment. The turbine supply costs include all of the scope for the WTG equipment that the Owner expects to complete the Project, including the total costs to supply, start-up and commission 87 Siemens SWT 2.3-108 WTGs with 108 m rotors. The turbine supply cost includes nacelles and hubs, 80 m towers, blade sets, down tower assemblies, climb assist devices for all WTGs, site-specific site suitability report, and transportation costs for all 87 WTGs. Additionally, Siemens will provide a WTG SCADA system, a condition monitoring system, a hot-weather package, and an advanced grid option (which includes LVRT capabilities). The costs for unloading and installing the WTGs and associated equipment furnished under the TSA, and the WTG aviation

lighting are included as part of the CSA scope of work. A five-year defect warranty period for the WTG equipment is provided under the TSA.

***BOP Construction Costs***

The BOP construction cost of $53,728,701 equals the CSA Price (inclusive of CSA LNTP No. 1 Change Orders 1 through 5 and CSA Change Orders 1 through 3). In the aggregate, the CSA Price represents the costs for surveying/engineering/testing, contractor mobilization and de-mobilization, site work including access roads and turnouts, crane pads, structural analysis, design and construction of foundations, erection of the WTGs, supply and installation of 87 WTG pad-mount transformers, the installation of the collector system including power cables and fiber optic link, installation of the Project Substation, the installation of the 345 kV Transmission Line, the Project Substation SCADA system, procurement and installation of 58 permanent FAA lights with brackets and 87 temporary FAA lights for the WTGs, procurement and installation of two permanent met towers and the installation of Siemens supplied met tower instruments, site restoration, and construction period insurance. The CSA Price also includes $805,543 for taxes on taxable Project equipment provided by Wanzek.

A LNTP No. 1 was established at a cost of $621,379 and was reduced by $60,538 by CSA LNTP No. 1 Change Order 1. CSA LNTP No. 1 Change Order 1 reduced the excavation of 9 WTG foundations by 3 feet, removed the installation of mud mats and added 270 feet of access road. CSA LNTP No. 1 Change Order 2 requires Wanzek to provide commercial general liability insurance, automobile liability insurance and umbrella liability insurance; however, this change order did not have any costs associated with it. CSA LNTP No. 1 Change Order 3 at a cost of $20,000 provides for the revision of the 30 percent electrical engineering submittals impacted by changing the project nameplate from 200 MW to 210 MW, and also to revise the 30 percent electrical engineering submittals and redesign of the collection circuit arrangement and studies in accordance with the Barr Geotechnical Report thermal resistivity test results. CSA LNTP No. 1 Change Order 4 at a cost of $26,000 provides for engineering deliverables. CSA LNTP No. 1 Change Order 5 at a cost of $2,750 provides for work associated with the resource asset registration form. The total cost of LNTP No. 1 is $609,591 (inclusive of CSA Change Orders 1 through 5) and is part of the CSA Price. LNTP No. 2 in the amount of $170,000 is for the procurement of collection cable and for continued management by Wanzek of ongoing work under the CSA, and is included in the CSA Price. CSA Change Order 1 at a cost of $1,848,000 provides for the update of the CSA construction schedule, schedule of values, milestone schedule, updates to certain TSA documents attached to the CSA and the cost for the CSA performance bond, and is included in the CSA Price. CSA Change Order 2 at a cost of $99,892 provides for the update of the CSA construction schedule, schedule of values, milestone schedule, and foundation design from 25 to 30 years, and is included in the CSA Price. There is no change in the CSA Price for CSA Change Order 3.

***Interconnection Facilities Costs***

The interconnection security costs are provided in the budget under "Other Project Costs" for the transmission provider's interconnection facilities pursuant to the GIA. The Owner reports that the first security payment of $100,000 was paid to Sharyland in the form of cash by the due date of March 13, 2018 (Project confirmation received that this was paid on March 13, 2018) and the second security payment of $822,600 which was paid in two parts - $350,000 on or before May 25, 2018 (Project confirmation received that this was paid to Sharyland on May 25, 2018) and $472,600 by June 8, 2018 (Project confirmation received that this was paid to Sharyland prior to June 8, 2018). The Owner reports that the $100,000 and $822,600 paid in cash to Sharyland will be returned to the Owner and replaced with a letter of credit ("LC"). The $922,600 cash reimbursement will be used by the Owner to pay for part of the costs for the Interconnection and Hedge Agreement LCs, and the $850,000 payment to ERCOT for the Project to be a market participant. See the discussion under Interconnection and Hedge Agreements security costs below for further description of the LC costs and ERCOT payment. In addition, the Owner will provide LCs to Sharyland for the remaining interconnection costs in the following amounts: $6,985,400 on or before June 29, 2018; and the final security LC in the amount of $5,272,000 on or before August 31, 2018. Costs for the LCs are also included in the Interconnection and Hedge Agreements security costs discussed below.

*Owner's Engineering*

The Owner reported that the Owner's engineering budget for the Project has been combined with the construction management costs below. However, all BOP engineering costs associated with the Project after financing are included in the CSA Price in the amount of $687,519.

*Construction Management*

The Owner has included an allocation of $2,408,118 in the Pro Forma construction budget for Owner's construction management services under the CMA, construction period services under the AMA and OMA, and Owner's engineering. These costs are also intended to cover the Management Fee under the CMA of $1,841,000, 15 months of construction financial management services under the AMA at $11,500 per month ($172,500), $30,000 for mobilization fee under the OMA, and the remaining balance of the construction management services fee for Owner's engineering.

*Start-Up Costs and Spare Parts*

The Owner has included an allocation of $1,066,932 for WTG spare parts in the TSA budget above. During the operating period, under the SMA, Siemens is required to maintain a suitable inventory of replacement and spare parts for the WTGs, including the spare parts described in Exhibit E to the SMA.

The Owner has indicated that it has included an allocation in the O&M budget for 2019 for the procurement of the initial inventory of BOP spare parts (as recommended by the Wanzek under the CSA). During the operating period, under the OMA, E.ON may utilize, but is required to maintain the initial inventory of BOP spare parts, and provide any other spare parts, components, lubricants and other maintenance items for the Project BOP as necessary to fulfill its obligations under the OMA.

*Construction Contingency*

The Pro Forma includes an allowance for construction contingency of $5,282,611, which is approximately 2.8 percent of the Subtotal Construction Costs. On the basis of the current construction status of the Project, the budgeted contingency is in the range of contingency of other projects of similar size, construction status, and technology with which we are familiar.

*Summary*

Based on our review of the capital costs and of the current construction status of the Project, we are of the opinion that the estimates which serve as the basis for the Total Construction Costs, including the construction contingency, were developed in accordance with generally acceptable engineering practices and methods of estimation. Further, the Subtotal Construction Cost budget of $189,357,862, including construction contingency, is in the range of costs of other projects of similar size, construction status, and technology with which we are familiar.

**Other Project Costs**

The other Project costs as delineated in the Pro Forma capital cost budget include insurance, landowner payment costs, and development costs, associated with the construction of the Project (the "Other Project Costs").

Turbine sales and use have been budgeted at a cost of $130,000. The TSA Contract Price does not include tax as the Owner is issuing certificates of exemption for use and sales taxes. The CSA Price includes taxes on taxable Project equipment provided by Wanzek as discussed above.

Construction period insurance costs have been included in the CSA Price under the BOP construction cost. Insurance coverages are expected to include general liability, automobile liability, professional liability, subcontractor's insurance, and an umbrella policy that are required for construction of the Project. The Owner is responsible for providing builder's all-risk insurance and operator's risk insurance, and an insurance cost of $271,730 has been included for general liability, umbrella, builders all risk, pollution, and delay in startup insurance. The Owner has budgeted $575,197 for Title Insurance.

Interconnection and Hedge Agreements security costs have been included in the construction budget in the amount of $1,388,409 pursuant to LCs required under the GIA and the Hedge Agreements. The security costs are based on GIA cost of $13,180,000 and Hedge Agreement (power hedge) cost of $55,000,000 and are broken down as follows: $682,000 for upfront fees on LCs; and $779,000 for LC fees during construction. The total LC costs during the construction period will be $1,461,000. In addition, the Owner will make a $850,000 cash payment to ERCOT for the Project to be a market participant and operate in real-time dispatch. The Owner will receive and apply the $922,600 cash reimbursement it receives from Sharyland (as discussed above under Interconnection Facilities Costs) towards: (1) payment of the remaining difference between the total LC costs and the construction budgeted amount for LCs ($72,591); and (2) the $850,000 cash payment to ERCOT. The Owner reports that the ERCOT payment will be returned and replaced with an LC or guaranty six months after the Project achieves the COD.

The Owner has budgeted a development cost of $8,366,885 for sponsor's fee and development costs. The work in progress costs would typically include the aggregate costs for: site investigations; building permits; ALTA; geotechnical and environmental surveys; wind studies; internal development staff; legal fees; electrical interconnection studies; success fees to early developers; and payments to governmental agencies.

The Owner has budgeted $7,315,838 for the SMA Upfront Payment, which is the pre-payment due for the first three years of service fees for the five-year term of the SMA. The pre-payment is to be paid within 30 days following commissioning, completion, and the commencement of unit operation of the last WTG.

The total Other Project Costs include estimated landowner payments of approximately $1,388,282. This includes landowner payments during construction of $238,282 for crop loss/construction damage compensation payments that are anticipated to be paid to the landowners during the construction period, and $1,150,000 for real estate land payments.

The Pro Forma budget does not include an estimate for capitalized property taxes during construction. The Owner advised that it does not expect to incur any other property taxes until after the construction of the Project is completed.

**Financing Costs**

Financing costs of approximately $18,090,519 include interest during construction ("IDC"), tax equity upfront, structuring and legal fees, construction financing fees and transaction costs. Estimated costs for IDC are based on the Owner's calculation of IDC that it expects to incur during construction of the Project (approximately $4,231,102). Tax equity fees are estimated to be $4,358,810. Construction financing fees are estimated to be $1,656,800. The Owner's budget for transaction costs is $7,843,807, which includes financing legal costs, and independent engineering and other consultant's fees.

**<u>Construction Schedule,</u>**

We reviewed a schedule titled *"Canadian Breaks – MacQuarie Capital – 87 Siemens 2.3MW – 200MW Summary Project Schedule"* and dated May 24, 2018 (the "Construction Schedule") that is included in CSA Change Order 3. The Construction Schedule is a five-page computer generated summary level bar chart schedule with specific start and finish dates representing when key procurement, construction and commissioning tasks are planned to be prosecuted. The construction activities in the Construction Schedule, as performed by Wanzek, may be summarized as follows:

| | |
|---|---|
| CSA Notice to Proceed | June 15, 2018 (1) |
| Mobilization | July 5, 2018 |
| Civil Construction (Roads, Laydown Yard, Crane Hardstands) | July 6, 2018 to January 18, 2019 |
| WTG Foundation Installation/Cure | July 18, 2018 to November 6, 2018 |
| O&M Building Construction Completion | October 11, 2018 to March 12, 2019 |
| Collection System Installation | November 8, 2018 to May 9, 2019 |

| | |
|---|---|
| WTG Deliveries | January 10, 2019 to March 20, 2019 |
| WTG Erection | January 10, 2019 to May 11, 2019 |
| Substation Construction | December 8, 2018 to June 28, 2019 |
| WTG Mechanical Completion | February 6, 2019 to May 11, 2019 |
| Met Tower Construction | January 7, 2019 to May 13, 2019 |
| 345 kV Transmission Line Construction | February 25, 2019 to June 29, 2019 |
| Backfeed Available | June 22, 2019 |
| Substation/345 kV Transmission Line Testing Completion | June 22, 2019 to June 29, 2019 |
| Guaranteed Substantial Completion (CSA) | August 2, 2019 |
| Final Completion (CSA) | October 8, 2019 |

(1) Date change per CSA Change Order 4 and LNTP No. 4. If NTP not provided by June 15, 2018, Wanzek is entitled to a change in schedule and CSA Price.

The Construction Schedule indicates a WTG erection rate of approximately 5 WTGs per week (87 WTGs in approximately 17.5 weeks). The construction approach (the "Construction Approach") includes items such as the WTG rate of erection, the amount of cranes and other equipment to be used and the availability of additional cranes (one main crane and crew, and two offloading cranes and crews), staffing, additional overtime when required, weather impact mitigation, and schedule recovery, if required. The Construction Schedule, as indicated by Wanzek, is based on a six-day work week with Sundays and holidays reserved for mitigation of weather/wind impact. The Construction Schedule includes a CSA Guaranteed Substantial Completion date of August 2, 2019.

We also reviewed Exhibit C1 "Siemens TSA Exhibit C1 - Work Schedule" included in Scope Change Order No. 16 to the TSA (the "TSA Milestone Schedule"). The TSA Milestone Schedule provides delivery dates of the WTGs over a 10-week period including 9 complete WTGs per week for 9 weeks (during the weeks of January 14, 2019 through March 11, 2019), and 3 complete WTGs per week during the weeks of January 7, 2019 and March 18, 2019. All WTGs are to be delivered to the Project by March 20, 2019, which is consistent with the Construction Schedule. The TSA Milestone Schedule also includes: pre-commissioning by Siemens of all WTGs at a rate of 9 WTGs per week except the last week which is for 6 WTGs, and starts the week of March 11, 2019 and is completed by May 18, 2019; stand still maintenance performed by Siemens starting the week of April 15, 2019 and ending on June 29, 2019; final commissioning by Siemens of all WTGs starting the week of July 1, 2019 and being completed by August 5, 2019; and anticipated final completion and site demobilization of Siemens personnel by August 9, 2019. The TSA Milestone Schedule includes 12 days of wind delay and weather delay occurring prior to commissioning completion of the WTGs; for delay days beyond the 12 days allotted, Siemens is entitled to an extension of the work schedule and an increase in the TSA Contract Price in accordance with the delay rates established in the TSA. The TSA Milestone Schedule WTG delivery dates and commissioning dates are consistent with the Construction Schedule.

The GIA Time Schedule, provided as Exhibit B to the GIA includes dates for completion of certain milestones associated with the TIF and the Project as follows: the "In-Service Date" is June 14, 2019 (the date on which the TIF have been completed and are ready to connect to the Project); the "Scheduled Trial Operation Date" is June 21, 2019 (the date on which the Project is ready for backfeed and commence with on-site testing operations and commissioning with the grid); and the "Scheduled COD" is September 13, 2019 (the date on which the Project is substantially complete, commissioning is complete and the Project is ready for commercial operation). The dates are subject to revision by mutual agreement between the Owner and Sharyland. Under the GIA, if the Project has not achieved COD within one year after the Scheduled COD, Sharyland can terminate the GIA. The GIA Time Schedule appears to support the grid power (backfeed) date in the Construction Schedule and the Owner has advised it will incorporate load banks as required for pre-commissioning.

Based on summary information available in the Construction Schedule, the TSA Milestone Schedule, and the GIA Time Schedule, we are of the opinion that, barring any unforeseen events that are prejudicial to material delivery, equipment delivery, or construction that directly affect the Project, the construction duration of approximately

13 months from the mobilization date by Wanzek of July 5, 2018 to the WTG Commissioning Completion Date by Siemens of August 5, 2019, and the final completion date under the CSA of October 8, 2019 is achievable and within the previously demonstrated capabilities of Wanzek and Siemens, using generally accepted project and construction management practices and adhering to a detailed work plan.

## TECHNICAL REVIEW OF THE FACILITY

### Review of WTG Technology

Siemens currently offers approximately 10 different WTG models ranging from 2.3 MW to 4.0 MW for both onshore and offshore use. Three of the models in its offerings are in the G2 Platform which have a rated capacity of 2.3 to 2.5 MW. These have rotor diameters of 101, 108, and 120 m, and the platform previously included 82 and 93 m diameter rotors. All of the G2 Platform turbine models are closely related to each other and share many components. At the end of 2015 Siemens reported an installed base of approximately 4,949 WTGs in the G2 Platform worldwide.

The Siemens SWT 2.3-108 WTG is one of the most recent variations in the Siemens G2 Platform, although it has been in commercial production for approximately five years. The Siemens G2 Platform was originally introduced by Bonus as the Bonus 2.3. In 2004, Siemens acquired Bonus, including the Bonus 2.3 design. The Siemens G2 Platform began with serial production of the constant speed, 82 m rotor diameter SWT 2.3-82 WTG in 2002. In 2004, Siemens began serial production of the SWT 2.3-82-VS WTG, a variable-speed version of the SWT 2.3-82 WTG and, in 2005, introduced the SWT 2.3-93 WTG, a 93 m rotor diameter version of the SWT 2.3-82-VS WTG. A 101 m rotor diameter model, the SWT 2.3-101 WTG, was introduced to the Siemens G2 Platform in 2009. The first SWT 2.3-108 WTGs were installed in 2008 as retrofits of larger rotors on SWT 2.3-101 WTGs. The first commercial installations of the SWT 2.3-108 WTG in the U.S. occurred in 2012.

The SWT 2.3-108 WTG is closely related to previous Siemens WTGs in their G2 Platform, including the SWT 2.3-82, SWT 2.3-93, and SWT 2.3-101 WTGs. Each design variation within this product line has incorporated relatively modest changes including:

- Introduction of "flatback" airfoils on the SWT 2.3-101 WTG blades.
- Introduction of pitch-twist coupling on the SWT 2.3-108 WTG blades.
- Enlarged hub and blade pitch bearings starting on the SWT 2.3-101 WTG.
- Different configuration of hydraulic cylinders for pitch actuation starting on the SWT 2.3-101 WTG.

Additional upgrades to the gearbox, main bearing, and blade design have been incorporated into the designs over time to increase reliability.

#### Technology Operating Experience

As of February 2018, a total of approximately 2,250 SWT 2.3-108 WTGs have been installed in North America, making it the most common SWT model used in North America. Siemens reported the availability in 2013 of the SWT 2.3-108 WTG was 96.9 percent based on 542 units operating; however, downtime due to blade inspections (as discussed below) was not included in the availability calculation. If included, the availability for 2013 drops approximately 5 percentage points to 91.9 percent. Siemens reported the availability in 2014 for the SWT 2.3-108 WTG was 98.0 percent based on 978 units operating, and in 2015 increased to 98.3 percent with 1,471 units operating. Given the similarities between the turbine models within the Siemens G2 Platform, the operating experience with the SWT 2.3-93 and SWT 2.3-101 WTGs provide some insight into the expected performance of the SWT 2.3-108 WTG. As of February 2018, Siemens reports there are approximately 1,800 SWT 2.3-93 and 1,860 SWT 2.3-101 WTGs installed in North America. The Siemens G2 Platform has encountered the following technical issues:

- Siemens experienced failures of "B53" blades on SWT 2.3-108 WTGs at two wind farms in 2013. Both projects had blades manufactured at Siemens' Fort Madison, Iowa factory. As a result of the failures, Siemens temporarily halted operation of all SWT 2.3-108 WTGs. A RCA found the failures to be the result of insufficient surface preparation leading to a weakened bond between the root segments and the main

laminate. The issue appears to be limited to the SWT 2.3-108 WTG, and specifically to a limited batch of blades made at the Fort Madison factory. Siemens developed a retrofit package that could be installed on WTGs with affected blades to remediate the issue. A modified design, the B53-02, is intended to address this issue for new WTGs and this issue is not expected to affect the SWT 2.3-108 WTGs at the Project.

- In November 2016, an SWT 2.3-108 collapsed at a project in the U.S. Siemens provided a summary of the root-cause investigation it performed which found that the failure originated at the shear web pin, where cracks formed and propagated, leading to the liberation of the blade from the WTG. The blade impacted the tower after it fractured, buckling the tower and resulting in the collapse. Siemens determined the rectangular shape of the shear web pin of the B53-00 blade introduced a stress concentration where the pin contacts the laminate. Siemens subsequently redesigned the shear web pin to eliminate the sharp corners and mitigate the stresses in the surrounding laminate in an improved blade design noted as the B53-02 version blade. Siemens has verified that the blades used at the Project will not require any retrofits or modifications due to this incident as they will be the B53-02 version blades, and the November 2016 failure was on a project using the older B53-00 version.

- Siemens has experienced a number of generator failures on the SWT 2.3-93 WTGs. According to Siemens, the generator failures have been related to stator wedges that shift, as a result of transporting generators prior to epoxy finishing coats being applied to the stator windings. Siemens stated that only the ABB supplied generators have experienced this issue and an improved wedge design, cooling system, and manufacturing process changes have been developed and the issue has not occurred in the SWT 2.3-101 or SWT 2.3-108 WTGs.

- Siemens has experienced failures of a number of main bearings. The main bearing failures have occurred on a number of project sites with SWT 2.3-93 and SWT 2.3-101 WTGs and Siemens has performed an RCA that identified three contributors to the problem as: (1) improper assembly at the bearing manufacturer; (2) material quality issues; and (3) a grease type that did not meet bearing requirements. Siemens has taken corrective actions to remedy these problems including more rigorous assembly procedures, use of higher quality steel, and use of an improved grease. Additionally, Siemens modified the bearing design in 2013, significantly increasing the width and contact angle of the rolling elements, which can be expected to increase bearing life. The 2016 Type Certificate for the SWT 2.3-108 lists the 240/800 updated bearing design as the only design currently being used.

- Siemens has experienced failures in the delta modules in the power electronics converters. A redesign in September 2010, known as "Skip 3," addressed the issues faced in the prior "Skip 2" version of the delta modules. Siemens has indicated that only a small number of Skip 3 modules have failed to date.

- In 2007, weld defects were discovered in towers supplied by a specific vendor. The weld defect was determined to be a batch issue related to the manufacturing process, and the affected towers were retrofitted in the field. The supplier of the defective towers is no longer used by Siemens.

- Following a blade failure in 2007, transverse wrinkles in the structural fiberglass laminate were discovered in early versions of the SWT 2.3-93 WTG blade. Approximately 700 blades were affected and repaired in the field or replaced, depending on the location and severity of the wrinkles. Siemens has modified the material selection and material layout process to address the cause of the wrinkles.

- Following a blade failure in 2010, Siemens conducted inspections on all of the blades in the potentially affected population. Less than 6 percent of the total population inspected had critical wrinkles. Siemens indicated that all blades with critical wrinkles will be repaired, but that these repairs must be conducted on the ground. Siemens traced the cause of these defects to a manufacturing process adjustment.

- Siemens has experienced failures in gearboxes from both of its gearbox suppliers (Winergy and Hansen). Siemens has made corrective actions to address the failure modes. These actions include tightening finishing specifications, improving bearing arrangements, and performing non-destructive inspection of finished components. These changes were incorporated into the "Type 6" and later models, which include Winergy 4456.6 and the Hansen EH851B. The Project will use Winergy gearboxes; however, the model number has not been finalized and could not be provided.

During the development of the Siemens G2 Platform, various quality and design problems have arisen and been addressed by Siemens as outlined in the list above, which represents both the various kinds of technical issues

that can arise and the different measures Siemens has taken in response. We are not aware of major design or manufacturing issues related to the SWT 2.3-108 WTG, with the exception of the B53 blade failures, which have since been addressed by Siemens. The types of quality and design problems encountered by Siemens have also been experienced by other WTG manufacturers. Siemens continues to make product modifications to remedy defects and improve reliability and cost effectiveness. To the extent that serial design or manufacturing issues occur during the five-year warranty period, the TSA contains a serial defect provision, based on a 15 percent minimum defect rate.

The Siemens G2 Platform of WTGs represents a mature MW-class WTG series. The current offerings within the Siemens G2 Platform are the result of an evolutionary design process, and the SWT 2.3-108 WTG will benefit from the knowledge gained from the operational experience of the preceding WTGs in the G2 Platform. The SWT 2.3-108 WTGs may inherit known and latent design and manufacturing problems from its predecessors and may develop unique problems that have yet to be experienced in the existing Siemens G2 Platform fleet. Through the development of the Siemens G2 Platform, Siemens has demonstrated the capability to address design and manufacturing quality issues. The level of technology risk associated with the SWT 2.3-108 WTG is equal to that associated with other Siemens WTGs in the G2 Platform, and other utility-scale WTGs that are widely deployed in the North American market.

**WTG Certification Status**

Independent certification of WTGs is carried out by several international agencies, including Germanischer Lloyd Industrial Services GmbH ("GL"), Det Norske Veritas Denmark A/S ("DNV"), and TüV NORD. DNV and DNV KEMA Renewables, Inc. are both subsidiaries of Det Norske Veritas. WTGs can be certified to one of several standards. In North America, the most frequently referenced standard is the International Electrotechnical Commission ("IEC") Standard, *"IEC TS 61400-22 Ed.1; Wind turbines –Part 22: Conformity Testing and Certification of Wind Turbines, 2010,"* and the GL certification guideline, *"Guideline for the Certification of Wind Turbines, Edition 2003 with Supplement 2004."*

WTGs are assessed and certified to specific inflow conditions, such as wind speed, turbulence intensity, wind shear, and air density. The IEC design requirement standard, *"IEC 61400-1 Ed. 3: Wind turbines- Part 1: Design requirements, 2005,"* defines specific wind turbine classes and turbulence intensity categories. The wind turbine class is denoted by a number, either I, II, or III, and the turbulence intensity sub-class is denoted by a letter, either A, B, or C. Class I is the highest wind speed class and Class III is the lowest wind speed class. Sub-class A is the highest turbulence intensity class and Sub-class C is the lowest turbulence intensity class. WTGs can also be assessed and certified to a unique manufacturer-defined wind turbine class, which is typically denoted as class "special" or "S."

The IEC certification standard defines four levels of certification, each of which results in a specific certificate: "Type Certificate," "Project Certificate," "Component Certificate," and "Prototype Certificate."

Type Certification involves a review of the entire WTG assembly, including the interface with the foundation (review of foundation not required). Type Certification requires a review of the design basis, WTG design, manufacturing process, and prototype testing. The prototype testing includes safety, functionality, power performance, and mechanical loads testing of the entire WTG assembly.

Project certification requires review of the site-specific conditions and foundation designs. Typically, a Type Certificate is required in order to pursue a Project Certificate. A Component Certificate is similar to a Type Certificate in that it is based on a review of the design, manufacturing process, and testing, but only covers a specific component of the WTG instead of the entire WTG assembly. Prototype certification consists of a review of the design, prototype test plan, and safety and functionality testing.

On July 15, 2016, DNV issued a Type Certificate (TC-DNV-DSS-904-00223-3) for the G2 Platform, Generation 1 SWT -2.3-108, 2.3-101 and 2.3-93 WTG according to IEC 61400-22: 2010 "*Wind Turbines – Part 22: Conformity Testing and Certification*". This certificate is in compliance with IEC 61400-1 Ed. 3 and certifies the turbine to IEC Classes IIA and IIB.

**WTG Suitability for Site Environment**

Site suitability is evaluated to confirm that the conditions the WTGs may experience at the Project Site do not exceed the loading conditions for which the WTG was designed and certified. The SWT 2.3-108 WTG has been certified to IEC Standard 61400-1 Ed. 3 Wind Turbine Class IIB. Table 7 compares the various characteristics of the Project Site to the SWT 2.3-108 WTG's IEC certification criteria. The wind resource conditions at the Project were assessed by AWS and their results are summarized in the AWS Energy Assessment.

**Table 7**
**Comparison of Project Site Conditions to**
**Siemens 2.3-108 WTG Certification Criteria**

| Site Parameter | Site Value (1) | SWT 2.3-108 WTG Class IIB Certification Criteria |
|---|---|---|
| Maximum Mean Annual Hub-Height Wind Speed (m/s) | 9.39 | 8.5 |
| Mean Air Density (kg/m$^3$) (2) | 1.06 | 1.225 |
| Extreme 3-Second Gust Wind Speed (m/s) | 42.4 | 59.5 |
| Extreme 10-Minute Wind Speed (m/s) | 34.6 | 42.5 |
| Maximum Mean Wind Shear Exponent | 0.11 | 0.20 |
| Mean Flow Inclination (°) | 1 (3) | 8 |
| Characteristic Turbulence Intensity at 15 m/s | 0.09 | 0.14 |
| Average/Extreme High Temperature (°C) (4) | +31.7 (5) / +32.1 (3) | +36.4 (3) / +45 (6) |
| Average/Extreme Low Temperature (°C) | -6.3 (5) / -24 (3) | -10 (3) / -24 (6) |

(1) Unless otherwise noted, source of information is from the AWS Energy Assessment.
(2) Kilogram per cubic meter ("kg/m$^3$").
(3) Siemens "*Climatic Conditions Review, Canadian Breaks Wind Farm*" September 28, 2016.
(4) Degrees Celsius ("°C").
(5) Temperatures represent the highest and lowest recorded temperatures at the nearby Vega, Texas National Weather Service reporting station between 1981 and 2010. Average data represent monthly average high and low temperatures for hottest and coldest months recorded during the period of record.
(6) Average high and low temperatures are the maximum and minimum operating temperature of the WTG. The extreme high and low temperatures are the maximum and minimum survival temperatures that the components and fluids are designed to withstand when the WTG is in a non-operational state. Operating and survival temperatures are WTG specification values, not certification criteria. Values noted are based on the Owner selecting the warm weather package.

Siemens assessed the suitability of the WTGs for the Project Site and documented the results of its analysis in the Siemens Site Suitability Report. While the climatic conditions in the Siemens Site Suitability Report are broadly consistent with the AWS Energy Assessment, the Siemens Site Suitability Report assumptions are slightly more conservative. Specifically, for the site's mean wind speed, Siemens has assumed more severe climatic conditions than the AWS Energy Assessment. The Siemens Site Suitability Report concludes that the 87 SWT 2.3-108 WTGs proposed for the Project are suitable for the Project Site with no wind sector management requirements.

We have compared the WTG coordinates used in the AWS Energy Assessment against those in the Siemens Site Suitability Report, and have determined no coordinates are off more than 1 m. Slight variances in this range are common in the industry and should not have an impact on the validity of the Siemens Site Suitability Report. Therefore, the original findings of the Siemens Site Suitability Report to not require wind sector management remains valid with respect to WTG locations in the AWS Energy Assessment. Changes to the layout during WTG micrositing resulting in moving WTGs by more than a few meters may require an updated Siemens Site Suitability Report.

The ability of a WTG to achieve its 20-year design life is influenced by the combination of inflow and other environmental conditions it experiences. The inflow conditions that have the greatest impact on the mechanical loading of the WTG are air density, wind speed, turbulence intensity, and wind shear. The mechanical loading of the WTG results from the cumulative effect of all these inflow conditions. If inflow conditions exceed the certification criteria, the design loads of the WTG may be exceeded, depending on the combination of the inflow conditions. Below

is an evaluation of the inflow conditions at the Project Site relative to the inflow conditions to which the SWT 2.3-108 WTG is certified:

- The estimated turbine-specific mean wind speed of 9.39 m/s at the most energetic WTG location is higher than the 8.5 m/s criteria to which the SWT 2.3-108 WTG is certified and, therefore, represents more severe loading conditions than those associated with the IEC certification value.
- The force exerted by the wind on a WTG is proportional to air density. The average hub-height air density at the Project Site is 1.06 kg/m$^3$, which is less than the IEC certification value of 1.225 kg/m$^3$ for the SWT 2.3-108 WTG and represents less severe loading conditions than those associated with the IEC certification value.
- Peak loading is associated with transient events such as extreme wind speeds, extreme turbulence, and emergency stops. The estimated extreme 10-minute average wind speed of 34.6 m/s for the Project Site is lower than the IEC certification value of 42.5 m/s and represents less severe loading conditions than those associated with the IEC certification value. The estimated extreme 3-second gust wind speed of 42.4 m/s for the Project Site is lower than the IEC certification value of 59.5 m/s and represents less severe loading conditions than those associated with the IEC certification value.
- Mean vertical wind shear is the change of wind speed with height above ground level. The most severe annual average wind shear exponent of 0.11 estimated for the Project Site is lower than the IEC certification value of 0.20 and thus represents less severe loading conditions than those associated with the IEC certification value.
- The wind speed frequency distribution Weibull shape factor is an indicator of the severity of a site's wind speed distribution. A Weibull shape factor that is higher than the IEC certification value typically represents less severe loading conditions. Based on the Siemens Site Suitability Report, the Weibull shape factor at the Project of 2.6 is higher than the IEC certification value of 2.0.
- Turbulence intensity is a measure of the fluctuations in wind speed over 10-minute intervals, and represents how gusty the wind is in a given location. The ambient turbulence intensity of 9.0 percent at the Project Site is lower than the IEC certification criteria of 14 percent for all proposed WTGs and thus represents loading conditions that are less severe than those associated with the IEC certification value.

We have reviewed the Project Site conditions as summarized in the Siemens Site Suitability Report and the AWS Energy Assessment. The maximum mean annual wind speed exceeds the design criteria of the SWT 2.3-108 WTG. However, the effect of this on loading conditions should be mitigated by the lower air density, lower shear, and lower turbulence intensity and are not significant enough to deem the WTG unsuitable for the site. While the inputs to the Siemens Site Suitability Report are broadly consistent with the AWS Energy Assessment, overall the inputs to the Siemens analysis are slightly more severe than that predicted by the AWS Energy Assessment. Furthermore, Siemens has calculated the loading conditions at each turbine location and confirmed that the WTGs can be operated safely at the Project with no operational constraints or curtailments. Thus, based on our evaluation of the AWS Energy Assessment and the results of the Siemens Site Suitability Report, the loading associated with the site conditions at the Project Site should be lower than the WTG design loads; hence, the SWT 2.3-108 WTGs are suitable for the Project Site.

**WTG Foundation Design**

We reviewed a set of issued for procurement Wind Turbine Foundation Preliminary Design Drawings Nos. S-01(F), S-02(A), and S-03(B), with the latest date of April 19, 2018 that were prepared by Barr Engineering Company ("Barr") of Minneapolis (the "Preliminary Design Drawings"). These drawings provided general foundation design details for the WTGs. Further, we reviewed a 90 percent revised foundation calculation package that was also prepared by Barr dated May 2018 (the "Preliminary Design Calculations").

The Preliminary Design Calculations included MathCad calculations which utilized output from a finite element analysis for the foundation configuration.

To assess the design of the WTG foundations, we compared the key foundation design information presented on the Preliminary Design Drawings with the WTG manufacturer's foundation loading requirements, the



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Preliminary Design Calculations, the recommendations made by Terracon in the Geotechnical Report, and our internal database of wind turbine foundations. Key design information that was compared included: the foundation loading; allowable bearing capacity; dimensions of the concrete outline; concrete and grout strength; grade, size and arrangement of the reinforcing steel; grade, size, and post-tension load of the anchor bolts; and specifications for the construction of the foundation.

The Preliminary Design Drawings and Preliminary Design Calculations indicate that the WTGs will be founded on circular spread footings. The Preliminary Design Calculations indicate one foundation type will be utilized, with an allowable bearing capacity of 2,500 psf. The buoyancy is not considered in the design of the WTG foundation, which is consistent with the recommendations of the Geotechnical Report. The base mat diameters for the WTG foundations will nominally be 55 feet-0 inches. The foundation thickness is to be approximately 9 feet-6-inches thick at the center (from base to the top of the pedestal) with a pedestal diameter of 19 feet. Further, the approximate minimum embedment depth (in the vicinity of toe of the foundation) as shown on the Preliminary Design Drawings is 8 feet-5.50-inches. We also note that the size and arrangement of the anchor bolts was consistent with the data in the included in the TSA exhibits.

The embedment of the wind turbine anchor bolts extends to within 2 feet-8-inches of the bottom of the base mat for the WTG foundations on the Preliminary Design Drawings. Based on our review of the Preliminary Design Calculations, the foundation design indicates that sufficient length will be provided to resist both the post-tensioning forces and the extreme wind overturning forces. In addition, the Preliminary Design Calculations indicate that the additional reinforcing bars that surround the anchor bolts have been sized to resist the forces that result from the extreme wind overturning forces; the Preliminary Design Calculations also indicate that a sufficient length of reinforcement below the anchor bolt embedment plate is provided. We note the Preliminary Design Drawings and the Preliminary Design Calculations indicate anchor bolts are pre-tensioned to 90,000 pounds per bolt; which includes an allowance for pre-tensioning losses in the anchor bolts.

The Preliminary Design Drawings specify over-excavation of 13 WTG foundations to depths ranging from 12 feet to 35 feet below the ground surface and backfilled with engineered fill to be compacted per the Standard Proctor density of 95 percent, which is consistent with the recommendation of the Geotechnical Report.

The applied loads noted on the Preliminary Design Drawings and the Preliminary Design Calculations for the WTGs are generally consistent with the design loads that are included in the TSA exhibits that have been provided for review.

The Preliminary Design Calculations also included fatigue analyses of the concrete and reinforcing steel. The fatigue analyses were performed in accordance with the procedures and recommendations of the DNV Offshore Standard, DNV-OS-C502 *"Offshore Concrete Structures,"* 2012 edition ("DNV-OS-C502"). The fatigue loads used in the analysis were based on the fatigue loading data that was provided by Siemens in the form of a Markov-style matrix with a 20-year design life for fatigue and factored by 1.5 for a 30-year design life. The Preliminary Design Calculations indicate that fatigue is not expected to impact the design or operation of the turbine foundation for a design life of at least 30 years.

Additionally, although the size of the reinforcing steel is greater, the arrangement of the anchor bolts, and the overturning moment correlate well with those of other WTG foundations designs of the same class that we have reviewed.

**Summary**

Based on our review, we are of the opinion that the Siemens SWT 2.3-108 WTG technology utilizes sound and proven design concepts, and has a substantial commercial operating history to date. Although the WTG model has experienced some blade and gearbox failures, these are somewhat typical of the issues faced by most utility scale WTGs. Furthermore, Siemens has demonstrated the ability and willingness to address and correct technical issues as they occur. Therefore, the SWT 2.3-108 is considered to present lower risk than most WTG models currently on the market.

Based on our review, we are of the opinion that the loading associated with the site conditions at the Project Site should be lower than the WTG design loads; hence, the Siemens SWT 2.3-108 WTG is suitable for the Project Site.

Based on our review of the Preliminary Design Drawings and the Preliminary Design Calculations, we are of the opinion that the design of the WTG foundations generally incorporated the recommendations of the Geotechnical Report and the WTG manufacturer. Further, the overall design of the WTG foundations, including the concrete outline, the specified backfill densities and compaction requirements, the specified material strengths of concrete, grout and reinforcement, and the size and arrangement of the reinforcement and embedded items shown on the Preliminary Design Drawings, is consistent with accepted wind industry practice.

**Estimated Useful Life**

WTG, designed in accordance with IEC 61400-1, has a design life of 20 years. Based on our review, we are of the opinion that, provided: (1) the Project is constructed as currently proposed; (2) the Project is operated and maintained by Siemens and the Owner in accordance with standard industry practices; (3) the wind resource conditions prove no more severe than those presented in the AWS Energy Assessment and the Siemens Site Suitability Report; and (4) all required renewals and replacements are made on a timely basis, the Project should have a useful life of at least 20 years.

**Projected Energy Production**

The wind resource conditions at the Project Site have been evaluated by AWS and energy production estimates for the Project are presented in the AWS Energy Assessment. We have not independently evaluated any of the Project wind resource data nor validated any estimates presented in the AWS Energy Assessment. We did, however, compare the assumed energy production of the Project in the Pro Forma against the technical projections included in the AWS Energy Assessment.

The TSA exhibits supplied by the Owner only include the "Normal Operation" power curve and a methodology for calculating the additional energy capture when the Power Boost feature is enabled; however, AWS stated its analysis includes the additional energy production from the Power Boost feature. The AWS Energy Assessment includes a table for the Normal Operation power curve at two air densities near the Project Site average air density, and a table for the Power Boost power curve at sea level air density. Rather than making large adjustments to the sea level Power Boost power curve provided in the AWS Energy Assessment, AWS elected to use in-house Power Boost power curves with air densities closer to the Project Site air density, to reduce errors introduced from large extrapolations. The in-house Power Boost power curves at various air densities could not be provided by AWS due to confidentiality; however, they stated that the sea level power curve in its in-house library matched what was provided by the Owner. AWS stated that according to Siemens, 20°C is the maximum ambient temperature at which the Power Boost feature can be utilized for an elevation range of 1,000 to 1,500 masl. The mean hub-height elevation at the Project Site is 1,207 masl. Based on this information, AWS estimated the WTGs would operate with the Power Boost feature enabled for approximately 2,046 hours per year.

The $P_{50}$ net energy production represents a level of production that has a 50 percent chance of being exceeded, on average, over the long term. The long-term $P_{50}$ net energy production assumed in the Pro Forma is 868.6 gigawatt-hours ("GWh") per year, corresponding to a net capacity factor ("NCF") of 49.5 percent, and is constant throughout the design life of the Project. The $P_{50}$ net energy production assumed in the Pro Forma is equivalent to the 10-year average $P_{50}$ net energy production presented in the AWS Energy Assessment. The $P_{75}$, $P_{90}$, and $P_{95}$ net energy production assumed in the Pro Forma are equivalent to the 10-year average $P_{75}$, $P_{90}$, and $P_{95}$ net energy production presented in the AWS Energy Assessment. The Pro Forma also includes Year 1 $P_{50}$, $P_{75}$, $P_{90}$, $P_{95}$, and $P_{99}$ average net energy production, which are equivalent to the first year net energy production values presented in the AWS Energy Assessment. In addition, the Owner has included annual curtailment values in the Pro Forma of approximately 3.2 percent in 2018 and 2019, 4.1 percent in 2020, 4.4 percent in 2021, 1.7 percent in 2022-2024, 0.6 percent in 2025-2028, and 1.5 percent thereafter, of which we have not independently verified.

In our experience, aside from long-term performance degradation, projects typically experience lower availability during the early operation period as minor technical issues such as nuisance faults arise and are addressed.

The first year annual average values reported in the AWS Energy Assessment include a lower initial availability assumption in the first year, which is reflected in the Pro Forma as lower energy production during the first year. In our experience, it is common for lenders to consider a sensitivity case including energy production during the first year of operation which is below the $P_{50}$, such as the $P_{75}$ or $P_{90}$, to account for variation in the wind resource and, to a lesser degree, WTG availability. The Pro Forma suitably provides first year probabilities based on lower WTG availability.

The Project must deliver an annual volume of approximately 731,000 megawatt-hours ("MWh") pursuant to the Hedge Agreement. The production requirement under the Hedge Agreement is approximately equal to the $P_{99}$ annual energy production specified in the AWS Energy Assessment and equal to approximately 84 percent of the long-term $P_{50}$ net energy production (including compensation for maximum curtailment discussed above) assumed in the Pro Forma. AWS projects $P_{50}$ energy levels that exceed the notional amounts in the Hedge Agreement. Hence, the assumed energy generation for the Project as represented in the Pro Forma would meet the minimum production level required under the Hedge Agreement. The Owner reports that it intends to enter into a Basis Hedge Agreement for a term of three years. The Basis Hedge Agreement is to mitigate potential cost differential between the Project node at the Sharyland Substation and the ERCOT North Hub based on the annual $P_{99}$ net energy production assumed in the Pro Forma, which the Project is capable of achieving.

**OPERATIONS AND MAINTENANCE**

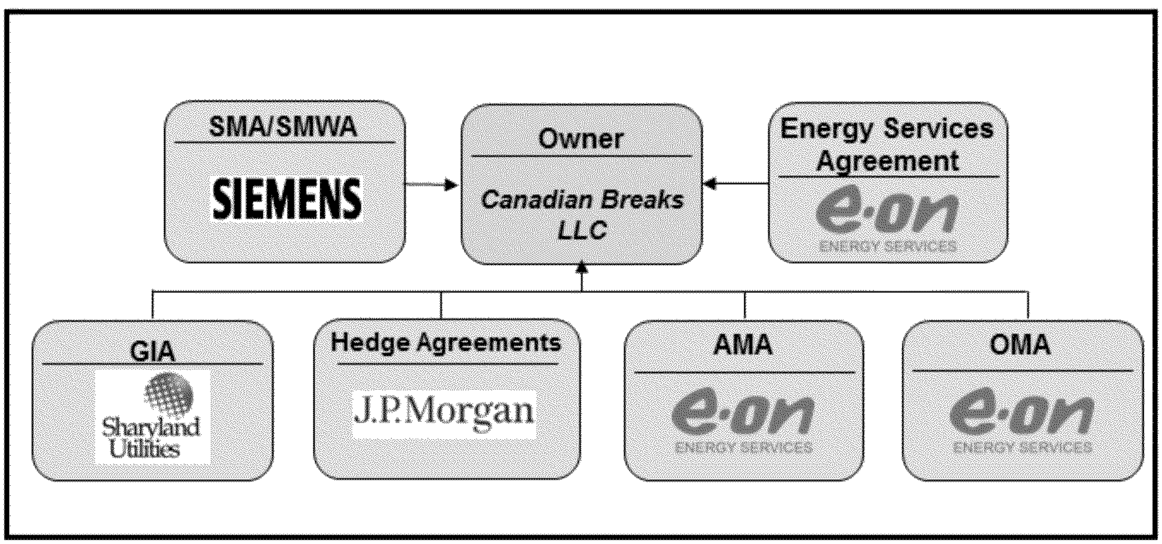
**Operating Agreements**

Oversight and O&M of the Project is to be provided through the implementation of multiple subcontracts under the overall management of the Owner. The contract structure is shown in Figure 5.

**Figure 5**

**Canadian Breaks Wind Project**

**Project Structure During the Operating Period**




The following discussion provides an overview of the Owner's approach for operating the Project, with a brief summary description of the key agreements used during the operating period.

**SMA**

Under the SMA, Siemens will service, maintain and support operations of the Siemens WTGs for a five-year period coinciding with the commencement date for each WTG and shall expire upon the expiration of the TSA's five-year warranty period applicable to such WTG. Siemens will provide scheduled and unscheduled turbine maintenance and service for the Project 87 Siemens SWT 2.3-108 WTGs and will monitor the performance of the WTGs both locally and remotely so as to provide 24-hour coverage. Siemens will receive a service fee in accordance with the SMA. In addition to the initial spare parts provided by the Owner pursuant to the TSA, Siemens under the SMA is required to provide service spare parts necessary to perform its obligations under the SMA. Any parts used by Siemens from the initial spare parts inventory is to be replaced by Siemens and placed in inventory.

A description of the warranty services is provided under the TSA which is discussed under the "Construction Arrangements" section of this Report. Siemens Gamesa Renewable Energy, S.A. is to provide a parent company guarantee for Siemens obligations under the SMA.

***Roles and Responsibilities***

Siemens has the following responsibilities under the SMA: (1) inspect, service and maintain each of the WTGs comprised within the Project by performing the scheduled services as required by and according to the service manuals, as may be periodically amended by Siemens (the "Scheduled Services"); (2) provide all tools, parts, consumables equipment, standard service vehicles, maintenance equipment, safety equipment, and other supplies necessary to perform the Scheduled Services; (3) provide all labor required for performance of the Scheduled Services; (4) coordinate all Services with Owner's representative; (5) hire and train Siemens personnel to perform their assigned duties; (6) monitor that the Siemens personnel complete required training, as applicable, including hazardous materials, occupational safety and health training; (7) supervise the Siemens personnel performing work at the Project Site; (8) provide technical and engineering support required for Siemens to meet its obligations under the SMA; (9) develop, implement and maintain the safety programs for Siemens personnel at the Project Site; (10) provide the monthly service report to the Owner's representative in the form set forth in SMA Exhibit B – Form of Monthly Report; (11) collect data and monitor the WTGs on a 24 hours per day, 7 days per a week ("24/7") basis from Siemens remote monitoring center using the SCADA system. In the case of an unscheduled shutdown, Siemens shall attempt to remotely reset the WTG and, if such attempt to remotely reset the WTG is unsuccessful, Siemens remote monitoring center shall send the necessary information to Siemens on-site personnel and Siemens shall assess the unscheduled shutdown during the following normal working hours; (12) keep the facilities and work area used by Siemens personnel clean and free from all waste and debris, and dispose of any major WTG components that are no longer operational (blades, hubs, nacelles, gearboxes, generators, towers, and unit components larger than 3 feet wide, 4 feet long and 3 feet tall); (13) perform inspections of the WTG safety equipment in accordance with Siemens normal service instructions and checklists. Inspections shall be documented on Siemens service checklist. If "Applicable Laws" require that the inspectors have additional certifications or training that were not required on the "Commencement Date," any reasonable expenses incurred by Siemens for obtaining such certifications and/or training shall be paid by Owner as a change order; (14) calibrate and test Siemens tools used by on-site personnel in the performance of the services in accordance with Applicable Laws and applicable U.S. standards. If Applicable Laws require that Siemens must have additional calibrations or testing of such tools than were required on the Commencement Date, any reasonable expenses incurred by Siemens for obtaining such further calibrations and/or testing shall be paid by Owner as a change order; and (15) provide inventory management of the spare parts for the WTGs.

The Owner has the following general responsibilities under the SMA: provide Siemens with 24/7 access to the Project Site; provide and maintain remote access to Siemens of the Project's SCADA system; operate the WTGs and the Project including controlling the energy output using prudent industry practices; obtain and maintain owner's permits and real property rights required to operate and access the Project Site; and provide a storage facility for spare parts and tools as required by the SMA. Additional responsibilities are detailed in SMA Exhibit A, Section 3 - Division of Responsibility Matrix.

***Term and Fee***

The term of the SMA shall commence on the "Planned Commencement Date," as specified by the Owner to Siemens pursuant to a written notice of commencement, and shall expire five years after the last WTG achieves

unit operation. The Owner will pre-pay the first three years of service fees for the five-year term of the SMA. Siemens shall receive an initial start-up fee of $7,315,838, (the "Initial Start-Up Fee") paid within 30 days following commissioning completion and the commencement of unit operation of the last WTG. The fee for the remaining two years of the SMA is $76.79 per day/per WTG. The fee requires that the Project be a non-union facility and provides Siemens unrestricted access 24/7. The service fee includes an annual escalation factor in accordance with the percent change in the Consumer Price Index for All Urban Consumers ("CPI-U") and escalation adjustments shall not decrease the service fee. The service fee excludes import duties and fees (including taxes) which is the responsibility of the Owner, and as it applies to spare parts, the Owner's liability for import duties and fees is limited to no more than 10 percent by value of the spare parts.

The SMA has provisions for both parties to terminate it due to default and also includes a provision to terminate the SMA if the TSA is terminated. The SMA may also be terminated by either party for force majeure event whereby either party is prevented from performing its obligations under the SMA for more than 180 consecutive days. For Owner termination due to Siemens default, Siemens is to be paid amounts due up to the date of termination, and if such termination occurs prior to the third anniversary of the commencement date, Siemens shall refund back to the Owner the remaining pro-rata portion of the Initial Start-Up Fee prepaid by the Owner as discussed above. Should the Owner be required to complete any unfinished work by Siemens as a result of an Owner termination, the Owner is entitled to recover the cost of any unperformed work under the SMA which is in excess of the service fee that would have been paid by the Owner, but in no event shall the excess cost be greater than 25 percent of the service fee. For Siemens termination due to Owner default, subject to cure rights by the financing parties, Siemens shall be paid all amounts due up to the date of termination and all direct costs incurred by Siemens for demobilizing and terminating subcontracts, plus 15 percent for general, administrative overhead costs and profit. If Siemens termination for Owner default occurs prior to the third anniversary of the Initial Start-Up Fee prepaid by the Owner as discussed above, the pro-rata portion remaining of the fee after the termination date shall be refunded to the Owner less any termination costs due Siemens as discussed herein. Siemens liability is not to exceed 100 percent of the services fee paid in the aggregate by the Owner.

***Warranty***

The SMA has warranties for the services provided under the agreement and for replacement spare parts. Siemens warrants services for a period of 2 years after completing service. Exhibit E of the SMA provides the list of spare parts. Siemens warrants spare parts for the period earlier of: (1) 24 months from installation, or (2) 30 months from delivery of a spare part to the Project Site. If before the parts warranty ends, any spare part fails to conform to the warranty and the Owner promptly notifies Siemens in writing of the failure, Siemens shall either: (1) repair or replace the defective spare part with a new or refurbished part; or (2) modify the defective spare part. The warranty for repaired, replaced or modified spare parts shall be for two years from the date the spare part was placed into service. Siemens shall use commercially reasonable efforts to schedule and perform warranty service so as to minimize disruptions to the operation of the Project. Siemens shall bear all its costs and expenses (including any charge for labor or equipment) associated with any warranty service, including necessary cranes, disassembly, transportation, repair, replacement and reassembly.

***SMWA***

The Owner also entered into the SMWA, which would commence upon expiration of the SMA (and the 5-year warranty under the TSA) for a term of 15 years. Under the SMWA, Siemens is to provide scheduled and unscheduled maintenance similar to the terms in the SMA, as well as component warranty and availability guarantee that are extended from the terms of the TSA. For years 6-10, the service fee under the SMWA is $43,636 per WTG; for years 11-15, the service fee is $48,943 per WTG; and for years 16-20, the service fee is $54,642. The service fees are subject to annual escalation under terms similar to those of the SMWA.

The SWMA provides a "Guaranteed Availability" of 97 percent and includes provisions for liquated damages of $8,000 per unit per each percentage, pro-rated for fractions of a percent, below the Guaranteed Availability. A bonus of 25 percent of the availability LDs for each percent above an annual average availability of 98 percent is also included.

The SWMA provides warranty provisions for any parts failing in the last two years of the term. Any part that fails during this period will have a two-year warranty but the warranty will not exceed beyond two years past

the end of the SMWA term. Siemens Gamesa Renewable Energy, S.A. is to provide a parent company guarantee for Siemens obligations under the SMWA. The Owner is obligated to pay Siemens Gamesa Renewable Energy, S.A. $76,995 upon the commencement date of the SMWA for the parent company guarantee.

For Owner termination due to Siemens default, Siemens is to be paid amounts due up to the date of termination. Should the Owner be required to complete any unfinished work by Siemens as a result of an Owner termination, the Owner is entitled to recover the cost of any unperformed work under the SMWA which is in excess of the service fee that would have been paid by the Owner, but in no event shall the excess cost be greater than 25 percent of the service fee. For Siemens termination due to Owner default, subject to cure rights by the financing parties, Siemens shall be paid all amounts due up to the date of termination and all direct costs incurred by Siemens for demobilizing and terminating subcontracts, plus 15 percent for general, administrative overhead costs and profit. In addition to the standard termination provisions for default and force majeure whereby either party is prevented from performing its obligations under the SMWA for 180 consecutive days, the Owner may terminate the SMWA for convenience 6 years after the commencement date of services for the last WTG, but must pay Siemens a termination fee in accordance with Table A of Section 8.2.3 of the SMWA.

**Asset Management Agreement**

Under the AMA, E.ON, acting as asset manager and administrator will provide day-to-day asset management and administrative support services during the operating period of the Project. E.ON shall employ qualified professional personnel to carry out the services as required under the AMA. The term of the AMA is ten years with an automatic renewal term of five years, unless terminated or not renewed by either party.

During the construction period, E.ON's responsibilities for providing construction financial management services (commencing on the construction financial management effective date of May 1, 2018 or such later date as may be extended in writing by the Owner to E.ON) include accounting, financial and tax services, treasury services, lease administration, record keeping, and provision of monthly status reports.

During the operating period (commencing two months prior to the commercial operations effective date, E.ON's responsibilities include asset management and supervision of the O&M and repair activities at the Project and coordination of all such activities with Siemens under the SMA. E.ON's responsibilities also include, but are not limited to: financial, controlling and accounting operations, recordkeeping, management of the annual audit process, tax return management, contractual compliance of the Project agreements listed in Exhibit J to the AMA, providing monthly reports, assisting the Owner in administering lease payments and notices to the landowners, administering property tax payments, maintaining North American Electric Reliability Council ("NERC") and ERCOT compliance and assistance in preparing NERC and ERCOT required reports, maintaining and administration of the Project permits and governmental approvals, and managing the Owner's insurance requirements and claims for the Project.

During construction, E.ON is to receive a monthly construction financial management services fee of $11,500 per month. Post-COD, E.ON will receive an annual services fee of $249,000 and reimbursement of any taxes and verifiable out-of-pocket costs and expenses of third parties used to perform the services under contract with E.ON or additional services as described in the AMA. The fees are subject to annual adjustment for inflation in accordance with the change in CPI-U starting in 2019. E.ON will be reimbursed for additional services it is asked to perform by the Owner from time to time.

Either party may terminate the AMA if the other party fails to make any payment when the payment is due (other than a disputed payment) and with 15 days' notice, or if the other party is in material breach of the AMA (other than force majeure) and with 30 days' notice, or if the other party terminates an affiliated agreement (i.e., the CMA, the AMA, or the ESA) for which there is no cure period. The Owner may terminate the AMA if there is a material breach on the part of E.ON, an event of default, or failure of E.ON to comply with the terms of the AMA (other than force majeure reasons) continuing for 30 days after notice, or if E.ON causes a default under a project agreement or real property agreement, or if E.ON is prevented from performing its obligation for a period of 90 days cumulative due to an event or force majeure. The Owner may terminate the AMA for convenience: up to the commercial operations effective date and shall reimburse E.ON for all reasonable demobilization costs and expenses related to such early termination plus any amounts due E.ON for services performed up to the date of termination; or after the commercial operations

effective date but must pay E.ON the termination fee stipulated in Section 10.6(c) of the AMA plus any amounts due E.ON for services performed up to the date of termination. E.ON's maximum liability for termination due to E.ON event of default is $250,000 less any amounts or payments claimed by the Owner, or 100 percent of the annual services fee for breach of contract.

**O&M Agreement**

E.ON, as operator, will perform O&M services of the BOP equipment and systems under the OMA. WTG O&M services are excluded from the OMA. The responsibilities of E.ON under the OMA include construction period and commercial operations services. The initial term of the OMA shall commence on its effective date and shall continue until the tenth anniversary of the commercial operations effective date, the date upon which the Owner has provided notice to E.ON to commence with commercial operations services. The OMA is automatically renewed for an additional five years thereafter unless terminated by the parties. E.ON is required to provide a full-time on-site manager that is qualified, certified and capable of prosecuting the obligations under the OMA with the assistance of third-party contractors. E.ON is required to perform its obligations in accordance with good industry practice, prudent wind power industry practices, and applicable laws.

***Construction Handover Services***

Construction handover services are to include, but are not limited to the following: E.ON is to provide assistance to and coordination and monitor with the CM to confirm: the construction work is progressing according to schedule; the work being performed by the service providers and compliance with health and safety programs; coordination and commissioning of the SCADA system; participate in on-site meetings coordinated by the CM; assist in preparing periodic reports; assist in performing final completion walk-downs of the work performed by Wanzek; establish and define deliverables for completion documentation including inspection reports and turnover packages; and other construction handover services as defined in Exhibit B of the OMA.

***Commercial Operations Services***

During the operations phase, E.ON is to provide services including, but not limited to the following: (1) supervision and coordination of planned and unplanned outages with the energy manager; (2) managing communications between the Project and landowners, regulatory and governmental officials; (3) monthly reporting; (4) management and inspection of all BOP components, arranging for maintenance of all BOP components, and disposal of worn out equipment or machinery; (5) coordination between the Owner and Siemens; (6) undertake end of warranty inspection of the BOP civil, collection system, and interconnection facilities; (7) development of an inspection and maintenance program for the BOP; (8) manage and oversee all scheduled and unscheduled maintenance and NERC compliance maintenance, visual inspections of foundations and tower connections, met tower inspections, monitoring and troubleshooting of malfunctions and failures of the Project; (9) monitoring service providers' performance, and keeping logs, maintenance schedules and records; (10) procuring, managing the receipt, warehousing and maintaining inventory of BOP spare parts, lubricants and other maintenance items, and establish and implement an inventory tracking and reporting system; (11) providing environmental and safety services; (12) providing remote monitoring services on a 24/7 basis at E.ON's ROC located in Austin, Texas; and (13) visually inspect, manage, oversee and cause service providers to perform WTG up-tower inspection, maintenance and report of FAA lighting on towers. FAA lighting maintenance will be performed as a reimbursable service. Management and reporting services under the OMA include developing of the annual operating plans, periodic audits of Siemen's performance under the SMA, preparing daily report records, coordinate monthly meetings with the asset manager and the Owner to discuss maintenance performance, monitoring Project performance, and notifying the Owner of unplanned outages. There are no provisions under the OMA for E.ON to assume responsibility of WTG O&M and, therefore, assumes that the Owner will engage Siemens under the SMWA to perform WTG O&M under after the SMA term.

***Fees and Termination***

The pricing structure of the OMA includes a fixed fee of $249,627 per year plus a one-time mobilization fee of $30,000 for operations phase services, and reimbursable expenses. The fixed fee is to be escalated annually in accordance with the change in the CPI-U.





Either party may terminate the OMA if the other party fails to make any payment when the payment is due (other than a disputed payment) and with 30 days' notice, or if the other party files for bankruptcy. The Owner may terminate the OMA if there is a material breach on the part of E.ON, an event of default, or failure of E.ON to comply with the terms of the OMA (other than force majeure reasons) continuing for 30 days after notice, or if E.ON causes a default under a project agreement or real property agreement, or default of E.ON under an affiliated agreement (i.e., the CMA, the AMA, or the ESA). Additionally, the Owner may terminate the OMA if: the commercial operations effective date does not occur by December 31, 2019 without any liability to E.ON; E.ON is unable to perform its duties due to force majeure event for a period of 90 cumulative days (consecutive or non-consecutive); for convenience after the earlier of the commercial operations effective date or December 31, 2019, in which case the Owner must pay E.ON the termination fee stipulated in Section 10.4(b) of this agreement, plus any amounts due for services performed up to the date of such termination. If the Owner terminates the OMA due to default by E.ON, then E.ON must pay the Owner the incremental costs incurred by the Owner as a result of the default including the Owner's engagement of a replacement O&M contractor for 18 months after termination of the OMA. E.ON's maximum liability for termination due to E.ON event of default is $249,627 less any amounts or payments claimed by the Owner. If E.ON terminates the agreement due to Owner default, the Owner must pay all amounts due for services performed and to reimburse E.ON for expenses in relocating its personnel from the site and otherwise demobilizing.

**Energy Services Agreement**

Under the Energy Services Agreement, E.ON is to provide day-to-day energy management services including scheduling, bidding and trading services, settlement services, and additional services as required, establishing and maintaining Project communications with ERCOT, and submitting energy trades to fulfill the Owner's obligations under the Hedge Agreement and merchant energy sales. E.ON will also provide all necessary support in meeting real-time telemetry requirements for the Project, provide day-ahead wind power production forecasts and monthly reports, provide access to raw settlement information, and responds to requests from NERC-registered entities. E.ON will assist the Owner to identify any ERCOT-directed curtailment orders. The effective date of the Energy Services Agreement, the date of which E.ON will start performing the services under this agreement is June 15, 2019, which may be extended by written notice by the Owner, but in no event be later than December 31, 2019. The initial term of the Energy Services Agreement is for five years starting on the effective date, and includes automatic one-year renewals thereafter unless terminated in writing by the parties. The Owner and E.ON will enter into a separate agency agreement, of which a form of agreement is provided as an exhibit to the Energy Services Agreement, under which E.ON will act at the QSE for the Project, establish a stand-alone settlement account for such purposes, and provide for compliance with ERCOT nodal protocols.

Under the Energy Services Agreement, E.ON will receive a fixed monthly fee of $9,500 (2018 dollars) excluding day-ahead trade strategy and congestion revenue rights ("CRR") trade strategy provided in Items (t) and (u) of Exhibit A to the agreement, or a fixed monthly fee of $15,500 (including Items (t) and (u)) upon agreement between the parties, which is subject to annual escalation starting on January 1, 2019 with the percent change in the CPI-U, plus reimbursement of out-of-pocket expenses with a 10 percent markup. The Owner is to also reimburse E.ON for any settlement charges and independent system operator ("ISO") charges paid by E.ON on behalf of the Owner. The fixed monthly fee is exclusive of state or federal taxes which shall be paid by the Owner. The Owner has the right to terminate the Energy Services Agreement for convenience, but must pay E.ON the termination fee stipulated in Section 8.3(b) of this agreement, plus any amounts due for services performed up to the date of such termination. Upon expiration or termination of the Energy Services Agreement, E.ON is to cooperate with the Owner in the orderly transfer of energy management responsibilities to a successor designated by the Owner for up to a maximum of 60 days, and the Owner shall continue to pay E.ON the fixed monthly fee plus all costs and expenses related to the services performed during such transfer period.

**Generator Interconnection Agreement**

The GIA is the standard form of interconnection agreement used for generating facilities connecting to utilities within ERCOT. The GIA is in effect until it is terminated by the Owner upon 30 days written notice to Sharyland, by Sharyland if the Project has not reached commercial operation within one year after the scheduled COD of September 13, 2019, or for uncured default. Under the terms of the GIA, Sharyland is to operate and maintain its system including the transmission service provider's interconnection facilities, while the Owner will own, operate, and

be responsible for the costs to maintain, repair and replace the generator's interconnection facilities and the Project. The facilities of both parties are to be operated and maintained in accordance with good utility practice, the National Electric Safety Code, ERCOT requirements, the Public Utility Commission of Texas rules, and all applicable laws and regulations. The GIA allows the Owner to interconnect a nominal capacity of 210.1 MW comprised of 87 WTGs at 2.415 MW each at the POI at the Sharyland dead end structure in the Sharyland Substation. The GIA does not address the sale or purchase of any electric energy, transmission service, or ancillary services either before or after commercial operation of the Project.

Outages for maintenance, repair, or replacements are to be scheduled at mutually agreeable times. In the event of an emergency causing a party to initiate an unscheduled outage, both parties are to use commercially reasonable efforts to minimize the duration of the outage. No changes may be made to the interconnection facilities without mutual consent. The GIA does not provide for any services other than the interconnection of the Project to the Sharyland transmission system. The Owner will be responsible for all costs associated with owning, operating, maintaining, repairing and replacing interconnection customer interconnection facilities. Sharyland will be responsible for all costs associated with owning, operating, maintaining, repairing and replacing its interconnection facilities.

**Hedge Agreements**

Commencing on the COD of the Project, the Owner will sell energy produced by the Project into the ERCOT market. To partially mitigate the variability in market energy price, the Owner reports that from the period commencing January 1, 2020 through December 31, 2032, an annual volume of approximately 731,000 MWh, which is approximately equal to the $P_{99}$ annual energy production specified in the AWS Energy Assessment, will be sold under the Hedge Agreement with JPM.

The fixed price amount under the Hedge Agreement is to be determined at Financial Close for all energy generated up to the annual volume and delivered to the Project's interconnection node. The floating price amount is based on the notional quantities set forth in the Hedge Agreement for each hour and the average hourly price at the ERCOT North Hub. A monthly settlement is calculated based on the notional quantity times the fixed price less a tracking account adjustment based on the mismatch between the generated energy times the nodal price at the point of delivery less the notional quantity times the floating price. If the settlement amount is positive, the Owner is to be paid that amount and if the settlement amount is negative the Owner is to pay the absolute value of the settlement amount. The value of the mismatch between the energy generated and delivered and the notional energy required under the Hedge Agreement is accounted for in a tracking account that is settled when the amount in the tracking account reaches a set limit.

While the POI for the Project is at the Sharyland Substation, the delivery point for the hedged energy is at the ERCOT North Hub, which could present a price difference between the two nodes. Analysis of potential nodal price difference is beyond the scope of this Report. To mitigate the potential price differential between the two nodes, the Owner plans to enter into a Basis Hedge Agreement with JPM. The Basis Hedge Agreement is to have a term of three years from the COD of the Project. The Basis Hedge will be for 50 percent of the $P_{99}$ energy production to be generated by the Project for the term of the agreement. Macquarie reports that it may elect to hedge the remaining 50 percent prior to the tax equity funding date of the Project. The fixed price is to be determined at Financial Close and the floating price is the hourly price at the ERCOT North Hub based on the average of the high and low price for the given hour. If the fixed price exceeds the floating price the Owner is to pay the difference times the notional quantity to JPM. If the floating price exceeds the fixed price, JPM is to pay the Owner the difference. The hedge is to be settled in full on a monthly basis with no tracking account. The Owner expects to enter into the Basis Hedge Agreement at Financial Close and will be required to post pre-COD security.

E.ON under the Energy Services Agreement will act as the QSE for the Project providing energy management services including connecting with ERCOT and provide scheduling services, settlement services, and additional related services. Macquarie reported that the Owner will retain the RECs and it is not expected that a contract for their sale will be entered into prior to Financial Close.

**Project Organization and Staffing**

Local operating capabilities for both WTG and BOP operation are to be available to the Owner through permanent on-site personnel. Day-to-day operations are to be carried out on site by E.ON for O&M of the BOP equipment and systems, and by Siemens for O&M of the WTGs at the Project O&M building. The on-site staff for the Project consists of the following: (1) the E.ON staff is comprised of an operations site manager; and (2) the Siemens staff comprised of a site manager, an administrative assistant, one lead technician, and approximately seven wind technicians. O&M training of the on-site staff is the responsibility of each of the organizations represented on site, and the Owner for establishing WTG training with the WTG manufacturer, and Wanzek for BOP O&M training.

From its ROC, during the term of the SMA, E.ON is to provide 24/7 remote monitoring through its ROC in Austin, Texas, and control services of all BOP equipment, monitoring of the interconnection system, communications with Sharyland and ERCOT, and call-out services of on-site personnel during off duty hours to respond to events related to the BOP civil, collection system and Project Substation. E.ON will utilize remote monitoring human machine interface/SCADA software, which provides for interrogation, assessment, monitoring and operation of a variety of operating functions, including the monitoring of alarms and trips within the Project Substation. Through its remote control center in Brande, Denmark, Siemens will be providing 24/7 remote monitoring and control services of the Project WTGs and WTG reset services, and will communicate with its local site staff and provide call out services during off duty hours to respond to WTG events occurring at the Project Site. Upon completion of the term of the SMA, the Owner expects to exercise its option to engage Siemens under the SMWA for continuation of WTG O&M services.

**Operations and Maintenance Costs**

The Owner presents O&M costs in the Pro Forma in several categories. For purposes of our analysis, we have categorized costs into two primary groups: "WTG & BOP O&M Expenses" and "Other Expenses." The WTG & BOP O&M Expenses indicated in the Pro Forma include "WTG O&M, Scheduled," "WTG O&M, Unscheduled & Consumables," and "BOP O&M." The Pro Forma also includes certain Other Expenses that are outside of the scope of our review such as "Asset Management," "Selling, General and Administrative ("SG&A")," "LC Cost," "Insurance," "Property & Other Taxes," and "Land." The Pro Forma is based on a COD of August 31, 2019. For purposes of our review, we have evaluated the first 20 years of expenses, corresponding to the 20-year design life of the WTG equipment. The inputs in the Pro Forma were presented in nominal dollars and are assumed by the Owner to escalate at an annual-inflation rate of 2.0 percent where applicable. For illustrative purposes and to adjust for the fact that the Owner is pre-paying for the first 3 years of WTG scheduled service per the terms of the SMA, we have provided a breakdown of the Pro Forma operating expenses in four 5-year groupings over the 20-year design life of the WTGs as shown in Table 8. Costs are presented in nominal dollars in project years with year 1 commencing on September 1, 2019, and year 20 ending on August 31, 2039.

**Table 8**
**Operating Budget Expenses (1)**
**($000)**

| Expenses | 1-5 | 6-10 | 11-15 | 16-20 |
|---|---|---|---|---|
| WTG & BOP O&M Expenses | | | | |
| WTG O&M – Scheduled (2) | 5,496 | 22,691 | 28,104 | 34,642 |
| WTG O&M – Unscheduled | 0 | 0 | 0 | 0 |
| SMWA Fee in Year 6 for PCG | 0 | 77 | 0 | 0 |
| BOP O&M | 2695 | 2,974 | 3,284 | 3,626 |
| Total WTG and BOP O&M Expenses | 8,191 | 25,742 | 31,388 | 38,268 |
| Other Expenses | | | | |
| Asset Management | 2,031 | 2,241 | 2,475 | 2,733 |
| SG&A | 1,538 | 1,697 | 1,874 | 2,070 |
| LC Cost and Release | -828 | 0 | 0 | 0 |
| Insurance | 1,394 | 1,539 | 1,699 | 1,876 |
| Property and Other Taxes | 10,515 | 9,272 | 9,949 | 6,409 |
| Land | 5,061 | 5,059 | 10,772 | 16,986 |
| Total Other Expenses | 19,712 | 19,809 | 26,779 | 30,074 |
| Total Operating Expenses | 27,903 | 45,551 | 58,167 | 68,342 |
| WTG & BOP O&M Expenses per WTG per year | 18.8 | 59.2 | 72.2 | 88.0 |
| WTG & BOP O&M Expenses per MW per year | 8.2 | 25.7 | 31.4 | 38.2 |

(1) Expenses as presented by the Owner assuming COD of August 31, 2019.
(2) Prepayment of $7,315,838 for the first 3 years of service fees under the SMA has been paid as part of the construction budget.

**WTG and BOP O&M Expenses**

The Pro Forma presents WTG and BOP O&M costs in three categories, including: WTG O&M - Scheduled; WTG O&M - Unscheduled; and BOP O&M. The Owner has assumed a fixed 2.0 percent annual escalation rate for WTG and BOP O&M costs, the bases of which are quoted below in 2017 dollars unless otherwise indicated.

During years 1-5, the WTG O&M - Scheduled expenses reflects the 3-year SMA prepayment made to Siemens as part of the construction budget in the Pro Forma, and the SMA contract rate of $28,028 per WTG annually for years 4 and 5, subject to escalation terms of the SMA. The TSA also includes an initial spares stock of $1,066,932 and a 5-year warranty period, which will cover the majority of unscheduled WTG issues during this period. BOP O&M expenses reflect the applicable contract rate of $498,000 per annum paid to E.ON, which includes a fixed fee of $249,627 per year and $248,000 for out of scope costs and reimbursable expenses pursuant to the terms of the OMA. Including the SMA and spare parts pre-payments, the Total WTG & BOP O&M expenses average approximately $8,200 per MW of plant capacity per year for this period.

During years 6-10, the WTG O&M, Scheduled expenses reflect the applicable contract rate of $43,636 per WTG paid to Siemens pursuant to the terms of the SMWA, which includes scheduled and unscheduled maintenance. The Pro Forma also includes adequate funding of the $76,995 payment by the Owner to Siemens upon commencement of the SMWA term for the Siemens parent company guarantee. All SMWA fees are included under WTG O&M, Scheduled in the Pro Forma and escalate pursuant to the escalation terms of the SMWA). BOP O&M expenses reflect the applicable contract rate of $249,627 per annum paid to E.ON which includes fixed fee and out of scope costs and reimbursable expenses pursuant to the terms of the OMA. The Total WTG & BOP O&M expenses average approximately $25,700 per MW of plant capacity per year for this period.

During years 11-20, the Total WTG and BOP O&M expenses continued to see significant escalation after operating year 10 with the escalation in the SMWA fee, which is $48,943 per WTG for years 11-15, and $54,642 per WTG for years 16-20. The SMWA fee includes scheduled and unscheduled WTG O&M. The Total WTG & BOP O&M expenses average approximately $31,400 per MW of plant capacity per year for years 11-15, and $38,200 per MW of plant capacity per year for years 16-20.

There is limited experience with WTGs of this size operating 10 years or more, thus, there is considerable uncertainty in O&M cost estimates in later years, however, the Owner has in place both the SMA for years 1-5 and the SMWA for years 6-20 which provides for fixed costs for scheduled and unscheduled WTG O&M significantly mitigating O&M cost risks. Additionally, while there is uncertainty in the number and timing of component replacements, rarely do projects replace major components as campaigns, but rather as major components fail, and hence, are broadly distributed.

**Spare Parts**

Appropriate budgets for spare parts vary widely, depending on factors such as the ability to share inventory with other projects, component failure rates, parts costs, and lead time for new parts orders. A robust spare parts inventory will contribute to improved WTG availability by reducing downtime. The Owner has included $1,066,932 in the TSA for initial spare parts funding during the 5-year warranty period. All spare parts used from this stock by Siemens during the 5-year SMA period and the 15-year SMWA period will be replaced at Siemens' expense, keeping the initial allotment whole for future use by the Owner. Under the OMA, E.ON is responsible for procuring and administering the BOP spare parts. The Owner reports that the first year's reimbursable expenses funded for the OMA will partly be used to procure the initial inventory of BOP spare parts recommended by Wanzek.

**Other Expenses**

The Owner has included additional non-technical expenses in the Pro Forma that we did not review, but are described here for completeness. The following discussion includes full 5-year expenses in 2017 dollars unless otherwise noted. Additional details noted below regarding the basis of various budgets have been provided by the Owner but have not been confirmed through review of supporting documents.

Asset management expenses are $2,031,000 for years 1-5, and reflect fixed price costs of $249,000 per annum paid to E.ON for the annual management fee inclusive of any administrative costs pursuant to the terms of the AMA, and $114,000 per annum (excludes the cost for optional additional services of $72,000 for day-ahead trade strategy and CRR trade strategy additional services – see discussion under Operating Agreements section of this Report) paid to E.ON pursuant to the terms of the Energy Services Agreement.

SG&A expenses are $1,538,000 for years 1-5, and are budgeted at a rate of $300,000 per annum.

LC cost and release expenses in the Pro Forma include LC costs under the Basis Hedge Agreement of $22,500 (annual depository fee of $7,500 in each of 2020, 2021 and 2022), and a release in 2020 of the $850,000 for the security posted at Financial Close with ERCOT (which is to be replaced with an LC or guaranty by the Owner) with a net result due the Owner of $827,500.

Insurance expenses are $1,394,000 for years 1-5, and are budgeted at a rate of $257,000 per annum for general liability, umbrella liability, business interruption, and pollution coverage.

Property and other taxes are budgeted, in nominal dollars, at $10,515,000 during years 1-5, $9,272,000 during years 6-10, $9,949,000 during years 11-15, and $6,409,000 during years 16-20. The variation of these expenses is driven by tax abatement agreements with the applicable counties and school district jurisdictions as well as the natural reduction of depreciable value over time.

Land costs are budgeted at $5,061,000 during years 1-5, and increase as noted in Table 8. These costs are driven primarily by realized revenues at a 6 percent royalty rate during years 1-10 and 8 percent royalty rate thereafter. The increase in land costs in the latter years of the Pro Forma reflect the increase in the royalty rate and the projected increase in merchant revenues after the expiry of the Hedge Agreement.

**Summary**

Based on our review, we are of the opinion that the staffing plan, organizational structure, and operating programs and procedures proposed for the Project are consistent with generally accepted practices in the industry. In addition, the various operating agreements proposed for the Project provide for the parts and services necessary to operate and maintain the Project.

Based on our review, we are of the opinion that the methodology used by the Owner in preparing the estimate of the WTG and BOP O&M Expenses for the Project, including the annual O&M services fee to be paid to Siemens, is reasonable, and the estimated WTG and BOP O&M Expenses, including the provision for spare parts, is comparable to the costs of similar wind energy facilities with which we are familiar.

## ENVIRONMENTAL REVIEW OF THE FACILITY

### Environmental Site Assessment

We have reviewed (1) the *"Phase I Environmental Site Assessment for the Canadian Breaks Wind Project, Oldham and Deaf Smith Counties, Texas"* dated October 2016, prepared for the Owner by Blanton & Associates ("Blanton"), (2) the *"Phase I Environmental Site Assessment for the Canadian Breaks Wind Project, Oldham and Deaf Smith Counties, Texas"* dated March 2017, prepared for the Owner by Blanton, (3) the *"Phase I Environmental Site Assessment for the Canadian Breaks Wind Project I, Oldham and Deaf Smith Counties, Texas"* dated September 2017, prepared for the Owner by Blanton, and (4) the *"Phase I Environmental Site Assessment for the Canadian Breaks Wind Project I, Oldham and Deaf Smith Counties, Texas"* dated February 2018, prepared for the Owner by Blanton. According to Blanton, the Project area consists of approximately 12,850 acres of land located in a rural area, historically consisting mostly of agricultural cropland and livestock grazing areas with a few playa lakes (a dry lake that may hold water on a seasonal basis). During its October 2016 site visit, Blanton's site representative observed primarily agricultural land containing irrigation infrastructure; scattered agricultural-related debris; barbed wire fences; asphalt, gravel and dirt roads; plowed fields; telephone and power lines; inactive farmsteads; cattle pens; and stock ponds. Blanton's site representative observed no evidence of stained soils, hazardous substances, water wells, oil and gas production activity, or areas containing construction and household trash and debris on any of the areas leased for the project. During its site visits conducted between February 26 and March 4, 2017, the Blanton representative observed construction of Project-related access roads and that portions of the Project Site had been cleared and leveled for construction of WTG foundations. The Blanton representative observed no evidence of stained soils, hazardous substances, water wells, oil and gas production activity, or areas containing debris (other than agricultural-related debris including wood and metal that was observed around some barns and abandoned or demolished farmsteads) during the February/March site visit. As a result of its September 13 to 19, 2017 site visit, the Blanton representative reported, "Portions of the Subject Property are currently being developed with wind farm infrastructure." Recent site photos indicated construction of Project-related access roads and site grading at WTG locations. The Blanton representative observed no evidence of stained soils, hazardous substances, water wells, oil and gas production activity, or areas containing recently disposed debris during the September 2017 site visit. During its February 1 to 6, 2018 site visit, the Blanton representative noted that the property was "being developed for the construction of wind turbines." Blanton observed no evidence of stained soils and stated, "No evidence of hazardous substances or petroleum products was identified on the Subject Property." Blanton concluded that its February 2018 assessment revealed no evidence of recognized environmental conditions in connection with the property. Blanton further noted that "Phase II environmental assessment activities are not recommended based on the information obtained for this report."

Based on our review, we are of the opinion that the February 2018 Phase I ESA performed by Blanton for the Project Site was conducted in a manner consistent with industry standards, using comparable industry protocols for similar studies with which we are familiar.

### Status of Permits and Approvals

The Project must be designed, constructed, and operated in compliance with applicable federal, state, and local regulations, codes, standards, guidelines, policies, and laws. Table 9 lists the summary status of environmental permits, approvals, and assessments required from various federal, state, and local agencies before the Project can be constructed and placed into commercial operation.

On the basis of our review, we are of the opinion that the Owner has identified and obtained the key environmental permits and approvals required from various federal, state, and local agencies to construct and operate the Project. While there are certain minor or ministerial permits and approvals yet to be obtained, we are not aware of any technical circumstances that would prevent the issuance of these remaining permits and approvals.

**Table 9**
**Summary Status of Environmental Permits, Approvals and Assessments**

| Permit or Approval | Responsible Agency | Current Status | Comments |
|---|---|---|---|
| **Federal** | | | |
| Aeronautical Obstruction Clearance, Determination of No Hazard to Air Navigation ("DNH") | FAA | Issued 7/15/15 for 16 WTGS; extension issued 1/31/17; expires 7/31/18. Issued 11/15/15 for 20 WTGs; expires on 5/18/17; extensions issued 5/17/17; expires on 11/17/18. Issued 5/17/16 for 51 WTGs; expires on 11/17/17; extension issued 11/21/17; expires 5/21/19.<br>The DNHs expire unless construction has commenced or if extended or revised. | To indicate that the WTGs do not interfere with air navigation. All WTGs require white paint; 58 WTGs require synchronized red lights. |
| Radio Spectrum Transmission Analysis | U.S. National Telecommunications and Information Administration ("NTIA") | Letter issued 6/6/08. | To identify if proposed WTG locations will interfere with communications transmissions. The Owner confirms that notification to the NTIA is voluntary and not required for construction of the Project. The letter indicated the Project will be located in a Department of Commerce radar line of sight. However, according to the National Oceanic and Atmospheric Administration ("NOAA") Radar Operations Center since the Project is located on private land, the federal government cannot approve, disapprove, or recommend any action of the Project. A Microwave Report was prepared by ComSearch on 3/27/15 and updated 12/27/16 identifying two microwave paths on site but concluding that the WTG locations would not cause obstruction to the known paths. |

**Table 9**
**Summary Status of Environmental Permits, Approvals and Assessments**

| Permit or Approval | Responsible Agency | Current Status | Comments |
|---|---|---|---|
| Clean Water Act ("CWA") Section 404 Permits – Nationwide Permits ("NWPs") 12 and 14 | U.S. Army Corps of Engineers ("USACE") | Preconstruction notification is not required as impacts are to be less than 0.1 acres. | For Project development within identified wetlands, under Section 404 of the CWA. Required if construction is located within jurisdictional waters of the U.S. Section 404 Permit authorizes the release of dredged or fill material into waters of the U.S., including wetlands. A Waters of the U.S. Report was prepared by Blanton in July 2015 and updated January 2017 and March 2017 concluding there will be three separate crossings, however, each are less than 0.1 acre and do not require notification under NWP 12 (Utility Line Activities) and/or NWP 14 (Linear Transportation). |
| CWA Section 10 Permit | USACE | Not required. | Required for construction in, on, or under a navigable water of the U.S. |
| National Historic Preservation Act ("NHPA") – Section 106 Consultation | USACE | Not required as the Project is located on private land. | Section 106 Consultations of the NHPA is required to take into effect impacts on historic properties due to the development of a project located on federal land or is funded by a federal agency. A Cultural Resources Survey has been prepared by Blanton discovering no archaeological sites within the Project construction area. |

**Table 9**
**Summary Status of Environmental Permits, Approvals and Assessments**

| Permit or Approval | Responsible Agency | Current Status | Comments |
|---|---|---|---|
| Threatened and Endangered ("T&E") Species Determination, Section 7 of Endangered Species Act | U.S. Fish and Wildlife Services ("USFWS") | A meeting with the USFWS and Blanton on 3/3/17 concluded with the USFWS having no major concerns and the avian and T&E risks at the Project location are considered to be low and similar to other operational wind facilities. | Required to assess impact of Project on T&E Species and other species of concern. A Critical Issues Analysis was prepared by Blanton 6/15/10 concluding no adverse impacts to threatened or endangered animals are expected. A four Season Avian Survey was conducted by Blanton in October 2011 and again in March 2016 with no observations of endangered or threatened species. A Lesser Prairie Chicken Habitat Assessment was prepared 4/6/15 by Blanton concluding that Lesser Prairie Chickens are not expected to be located in the Project area. A Three Season Acoustical Bat Survey was prepared in February 2016 by Blanton concluding no listed bat was detected and the project area has a low potential for bat mortality. |
| Incidental Take Permit ("ITP") – Section 10 of the Endangered Species Act | USFWS | Blanton indicates an ITP will not be required. | A review of the Project area for Endangered Species Act listed species found that, although the ranges of several listed species overlap the Project area, the Endangered Species Act listed species are unlikely to occur in the Project area regularly. There are no requirements to obtain an ITP or eagle take permit at this time. |
| Bald and Golden Eagle Protection Action ("BGEPA") | USFWS | Not required. Blanton has determined that the Project poses low risk to eagles. | The BGEPA provides for the protection of the bald eagle and golden eagle by prohibiting the take, possession, or sale of any bald or golden eagle. To facilitate issuance of permits, the USFWS drafted Eagle Conservation Plan Guidance in 2013 to guide developers when eagles are identified as a potential risk. |
| Migratory Bird Treaty Act ("MBTA") | USFWS | Blanton confirms that the Project was sited to avoid impacts to migratory birds. | The MBTA prohibits the taking, killing, possession, transportation, import, and export of migratory birds without a USFWS permit or other regulatory authorization. |

**Table 9**
**Summary Status of Environmental Permits, Approvals and Assessments**

| Permit or Approval | Responsible Agency | Current Status | Comments |
|---|---|---|---|
| Oil Spill Prevention Control and Countermeasure Plan (for Substation Transformer(s)) | U.S. Environmental Protection Agency ("USEPA") | Plan to be completed, if required. | Required as per 40 CFR 112, Oil Pollution Prevention regulations, if the Project stores more than 1,320 gallons at the site. |
| Hazardous Waste Generator Registration | USEPA | To be obtained prior to commercial operation, if required. | Required for the management and disposal of hazardous waste. Manifest system must be followed. |
| **State** | | | |
| Biological Assessment Approval/ State-listed Species Impact Assessments | Texas Parks and Wildlife Department ("TPWD") | No consultations were identified. No impacts to T&E species are expected. | Typically required to assess the impact of the Project on state-listed plants, birds, mammals, reptiles, amphibians, and aquatic invertebrates. Title 31 of the Texas Administration Code regulates the taking, of endangered or threatened species. Reports and surveys conducted by Blanton did not identify any state-listed species located on site. |
| Cultural and Historical Resources Determinations | State Historic Preservation Office, Texas Historical Commission | Not required, the Project is located on private land. | As required to assess the impact of the Project on cultural and historical resources. The Project is located on private land and has no federal nexus. A Cultural Resources Survey was prepared 7/18/15 and updated November 2016 by Blanton identifying no archaeological sites on the Project Site. A Cultural Resources Survey was updated and prepared 3/22/17 by Blanton concluding no historical sites within the Project construction area. |
| Section 401 Water Quality Certification | Texas Commission on Environmental Quality ("TCEQ") | Not required. | For Project development within identified wetlands, if applicable. TCEQ conditionally approves activities authorized under NWPs 12 and 14. |
| Texas Pollutant Discharge Elimination System General Permit Associated with Construction Activities | TCEQ | Notice of Intent ("NOI") to be filed prior to the start of construction. | Required for stormwater management during construction. Owner confirms that a Stormwater Prevention Pollution Plan will be developed prior to the start of construction. |
| Texas Pollutant Discharge Elimination System General Permit Associated | TCEQ | Not required as the Project is not a listed category. | Required for stormwater management during operations. |

**Table 9**
**Summary Status of Environmental Permits, Approvals and Assessments**

| Permit or Approval | Responsible Agency | Current Status | Comments |
|---|---|---|---|
| with Industrial Activities | | | |
| Air Quality Standard Permit for Concrete Batch Plant | TCEQ | Permit to be obtained prior to the batch plant to be located on site. | Required for air emissions of an on-site temporary concrete batch plant. |
| **Local** | | | |
| Zoning Permit | Oldham County and Deaf Smith County | Permits are not required according to issued Road Use Agreements. | Typically required for construction and zoning approvals in accordance with municipal codes, ordinances, and regulations. Use of County roads and County-owned ROWs for road use has been granted to the Owner pursuant to the Oldham County Road Use Agreement and the Deaf Smith County Road Use Agreement. |
| Road Crossing Permits | Oldham County | 10 Permits issued 11/13/17. | Required for underground collection system crossings of county roads. |
| Building/Construction, Encroachment Permits | Various local agencies | To be obtained, as required | Required for the construction of the project in accordance with local regulations and ordinances. |

**<u>Environmental Compliance</u>**

Species of concern are protected under several statutes including the Endangered Species Act, BGEPA, and MBTA, all of which prohibit the "take" of protected species. While "take" is defined differently under the three statutes and implementing regulations, the Endangered Species Act and BGEPA allow the USFWS to authorize via permits the limited, non-purposeful (i.e., incidental) take of protected species during otherwise lawful activity. The ITP specifies the protected species and must include development of associated habitat conservation plans ("HCP"), which are made binding through the ITP and include strategies to minimize, mitigate, and monitor impacts from the covered activities, as well as funding assurances for proper implementation. Applying for an ITP would reduce and/or minimize risk should take occur in the future, as if this occurs, adverse impacts to the Project will be greater without a permit. However, pursuant to surveys conducted; Blanton reported that the Project is unlikely to result in the take of a federally-listed T&E species and, therefore, an ITP is not being applied for and is not expected to be required. A Final Bird and Bat Conservation Strategy ("BBCS") Plan dated April 2017 was developed by Blanton outlining Best Management Practices during construction and operation in order to minimize adverse impacts to wildlife including preconstruction surveys, habitat impact assessments, and the development of any mitigation measures as required, and post-construction injury and mortality monitoring and reporting.

In March 2012, the USFWS published the "*Land-based Wind Energy Guidelines*" ("WEG") to guide developers and wildlife agencies using a five-tiered approach that provides a detailed framework for evaluating impacts on species and habitat, beginning with site evaluation and continuing through post-construction studies. Following the WEG is voluntary and does not relieve a project proponent from responsibility to comply with the regulations or preclude enforcement, but as stated in the guidelines "if a violation occurs the Service will consider a developer's documented efforts to communicate with the Service and adhere to the Guidelines." The Owner confirmed that the Project has been developed in accordance with the WEG.

Currently, the MBTA does not contain permit provisions for the take of migratory birds. It is a strict liability statue whereas proof of intent, knowledge, or negligence is not required of an MBTA violation. The WEG encourages companies to work with USFWS biologists to identify available protective measures when TCEQ

conditionally approves activities authorized under NWPs 12 and 14 developing project plans and/or avian protection plans and to implement those measures prior to and during construction. Blanton confirms that many of the Best Management Practices' outlined in the WEG have been incorporated into the Project to avoid and minimize impacts to migratory birds.

**Equator Principles**

During 2002, several banks, together with the World Bank Group ("WBG") and the International Finance Corporation, convened in London to discuss social and environmental issues in project financing, which led to the drafting of the Equator Principles in June 2006. Further revisions include the governance rules in July 2010 and incorporation of revised "IFC Performance Standards," which reflect an updated sustainability framework, for projects initiating an Environmental and Social Impact Assessment after January 1, 2012. The most recent revisions have led to the third version of the Equator Principles, known as "EP III." EP III became effective June 4, 2013 and includes the following 10 principles:

- Principle 1: Review and Categorization
- Principle 2: Environmental and Social Assessment
- Principle 3: Applicable Environmental and Social Standards
- Principle 4: Environmental and Social Management System and Equator Principles Action Plan
- Principle 5: Stakeholder Engagement
- Principle 6: Grievance Mechanism
- Principle 7: Independent Review
- Principle 8: Covenants
- Principle 9: Independent Monitoring and Reporting
- Principle 10: Reporting and Transparency

The more than 80 financial institutions subscribing to the Equator Principles seek to ensure that the projects they finance are developed in a manner that is socially acceptable and reflective of sound environmental management practices. Under EP III, "Designated Countries," such as the U.S., are deemed to have robust environmental and social regulatory requirements and programs which generally meet or exceed the requirements of certain principles, such as the requirement for an environmental and social assessment. However, all of the Equator Principles requirements must be satisfied regardless of the location, type, or category of the project.

The Equator Principles includes a categorization standard for projects based on the magnitude of social and environmental impacts associated with the project. Categories are denoted by a letter, either A, B, or C. Category A represents projects with the potential for significant adverse social or environmental impacts, and Category C represents projects with minimal or no social or environmental impacts. Category B represents projects with limited potential for adverse social or environmental impacts which are largely reversible and readily mitigated.

The Project is subject to EP III and our assessment of compliance with the 10 Equator Principles is based on our knowledge of the project, our understanding of the required permits and approvals process, and on information provided by Macquarie in response to our questions and data request. As with the previous versions of the Equator Principles, EP III deems compliance with Designated Country laws to satisfy the following:

- Principle 2: Environmental and Social Assessments;
- Principle 3: Applicable Environmental and Social Standards;
- Principle 4: Environmental And Social Management System and Equator Principles Action Plan;
- Principle 5: Stakeholder Engagement; and
- Principle 6: Grievance Mechanism.

All of the remaining Equator Principles must still be satisfied regardless of the location, type, or category of the project. On the basis of our review, we offer the following observations regarding Equator Principles compliance:

- The Project can be categorized as a "B." (Principle 1: Review and Categorization).
- The Owner has followed the prescribed process and has obtained the required permits and authorizations for construction and operation of the Project. This process includes discretionary permits and public notice requirements. The permits and authorizations include various conditions related to monitoring, recordkeeping, and reporting. Jurisdictional agencies for the required permits and authorizations include the USACE, the USFWS, MDEQ, and MDNR. Successful completion of the permitting process and along with our review satisfies the requirements of Principle 7 (Independent Review).
- Compliance with the Equator Principles is contingent upon the Project obtaining the permits and approvals required for construction, as well as credit documents and their covenants requiring compliance with all applicable environmental requirements, including the Equator Principles (Principle 8: Covenants).
- As appropriate for Category B projects, Principle 9 requires the appointment of an Independent Environmental and Social Consultant, or that the client retain qualified and experienced external experts to verify monitoring information. Such appointments may not be necessary for wind facilities of this size and type.
- To satisfy Principle 10 (Reporting and Transparency), the Equator Principle Financial Institutions is required to report annually on its Equator Principles transactions and implementation in accordance with the minimum requirements of Annex B.

Based on the considerations above and our review of the Project in relation to Equator Principles requirements, we are of the opinion that Project presently is in, and should be capable of maintaining, material compliance with Equator Principle requirements and can be categorized as a "B."

**PRINCIPAL CONSIDERATIONS AND ASSUMPTIONS**

In the preparation of this Report and the opinions that follow, we have made certain assumptions with respect to conditions which may exist or events which may occur in the future. While we believe these assumptions to be reasonable for the purpose of this Report, they are dependent upon future events, and actual conditions may differ from those assumed. In addition, we have used and relied upon certain information provided to us by others. While we believe the use of such information and assumptions to be reasonable for the purposes of this Report, we offer no other assurances with respect thereto and some assumptions may vary significantly due to unanticipated events and circumstances. To the extent that actual future conditions differ from those assumed herein or provided to us by others, the actual results will vary from those projected herein. This Report summarizes our work up to the date of the Report; thus, changed conditions occurring or becoming known after such date could affect the material presented to the extent of such changes.

The principal assumptions made by us in preparing the Report and the principal information provided to us by others include the following:

1. As Independent Engineer, we have made no determination as to the validity and enforceability of any contract, agreement, term sheet, rule or regulation applicable to the Project. For the purposes of this Report, we have assumed that all contracts, agreements, rules and regulations will be fully enforceable in accordance with the contractual terms. Moreover, it is assumed that all parties will comply with and fulfill the provisions of the contracts and agreements.

2. The Project will be designed and constructed in accordance to the technical provisions of the contracts, the permit requirements, federal, state and local regulations, industry standards and major equipment supplier requirements.

3. Wanzek will undertake generally accepted project management techniques to closely monitor construction and will react in a timely fashion to lagging performance. The Owner will discharge its schedule obligations under the CSA and GIA, and Sharyland will meet the schedule specified under the GIA, so that the Project will be available for commercial operation in accordance with the project schedule.

4. The Owner, E.ON, and Siemens will employ qualified and competent personnel who will properly operate the equipment in accordance with generally accepted industry standards, will operate the equipment within the ratings and limits established by the equipment vendors, and will generally operate the Project in a sound and businesslike manner.

5. The Owner, E.ON, and Siemens will maintain the Project in accordance with generally accepted industry standards and with the manufacturer's recommendations, and will make all required renewals and replacements in a timely manner.

6. All licenses, permits and approvals necessary to construct and operate the Project will be obtained on a timely basis and any changes in required licenses, permits or approvals will not result in changes in design, construction delays, reduced operation, or increased capital or operating costs of the Project.

7. During the construction period, there will be no adverse events such as transportation and labor difficulties, unusually adverse weather conditions, the discovery of hazardous materials or waste not previously known, or other abnormal events that are prejudicial to normal construction or installation

8. During the preparation of this Report we have reviewed certain draft Project Agreements between the Owner and its suppliers. We have assumed that the draft Project Agreements will be executed in the form of the draft agreement provided for our review.

## CONCLUSIONS

Set forth below are the principal opinions we have reached after our review of the Project. For a complete understanding of the estimates, assumptions, and calculations upon which these opinions are based, the Report should be read in its entirety. On the basis of our review and analyses of the Project and the assumptions set forth in this Report, we are of the opinion that:

1. Wanzek, as BOP contractor, Solas Energy I, LLC, as construction manager, and Siemens, as WTG supplier, have previously demonstrated the capability to construct wind facilities of similar size and technology as the Project, and Siemens, as WTG service provider, and E.ON, as asset manager, operator, and energy services provider, have previously demonstrated the capability to operate and manage wind facilities of similar size and technology as the Project.

2. The Geotechnical Report provides information and recommendations that should be sufficient to support the design of the WTG foundations and which is consistent with current wind industry practice. Further, provided that the Owner and Wanzek follow the recommendations made by Terracon in the Geotechnical Report regarding subsurface conditions and foundations during design and construction of the Project, the Project Site should be suitable, from an infrastructure and geotechnical perspective, for construction, operation and maintenance of the Project.

3. The Project Site is of adequate size to support the construction, operation and maintenance of the Project, and provides sufficient access for transportation of equipment and the transmission of the generated electricity to the POI.

4. The aggregate of the TSA and the CSA provide the facilities and services required for the construction of the Project, and the GIA provides for the interconnection of the Project to the ERCOT transmission system.

5. The estimates which serve as the basis for the Total Construction Costs, including the construction contingency, were developed in accordance with generally acceptable engineering practices and methods of estimation. Further, the Subtotal Construction Cost budget of $189,357,862, including construction contingency, is in the range of costs of other projects of similar size, construction status, and technology with which we are familiar.

6. Barring any unforeseen events that are prejudicial to material delivery, equipment delivery, or construction that directly affect the Project, the construction duration of approximately 13 months from the

mobilization date by Wanzek of July 5, 2018 to the WTG Commissioning Completion Date by Siemens of August 5, 2019, and the final completion date under the CSA of October 8, 2019 is achievable and within the previously demonstrated capabilities of Wanzek and Siemens, using generally accepted project and construction management practices and adhering to a detailed work plan.

7. The Siemens SWT 2.3-108 WTG technology utilizes sound and proven design concepts, and has a substantial commercial operating history to date. Although the WTG model has experienced some blade and gearbox failures, these are somewhat typical of the issues faced by most utility scale WTGs. Furthermore, Siemens has demonstrated the ability and willingness to address and correct technical issues as they occur. Therefore, the SWT 2.3-108 is considered to present lower risk than most WTG models currently on the market. The loading associated with the site conditions at the Project Site should be lower than the WTG design loads; hence, the Siemens SWT 2.3-108 WTG is suitable for the Project Site.

8. The design of the WTG foundations generally incorporated the recommendations of the Geotechnical Report and the WTG manufacturer. Further, the overall design of the WTG foundations, including the concrete outline, the specified backfill densities and compaction requirements, the specified material strengths of concrete, grout and reinforcement, and the size and arrangement of the reinforcement and embedded items shown on the Preliminary Design Drawings, is consistent with accepted wind industry practice.

9. Provided: (1) the Project is constructed as currently proposed; (2) the Project is operated and maintained by Siemens and the Owner in accordance with standard industry practices; (3) the wind resource conditions prove no more severe than those presented in the AWS Energy Assessment and the Siemens Site Suitability Report; and (4) all required renewals and replacements are made on a timely basis, the Project should have a useful life of at least 20 years.

10. The staffing plan, organizational structure, and operating programs and procedures proposed for the Project are consistent with generally accepted practices in the industry. In addition, the various operating agreements proposed for the Project provide for the parts and services necessary to operate and maintain the Project.

11. The methodology used by the Owner in preparing the estimate of the WTG and BOP O&M Expenses for the Project, including the annual O&M services fee to be paid to Siemens, is reasonable, and the estimated WTG and BOP O&M Expenses, including the provision for spare parts, is comparable to the costs of similar wind energy facilities with which we are familiar.

12. The February 2018 Phase I ESA performed by Blanton for the Project Site was conducted in a manner consistent with industry standards, using comparable industry protocols for similar studies with which we are familiar.

13. The Owner has identified and obtained the key environmental permits and approvals required from various federal, state, and local agencies to construct and operate the Project. While there are certain minor or ministerial permits and approvals yet to be obtained, we are not aware of any technical circumstances that would prevent the issuance of these remaining permits and approvals.

14. The Project presently is in, and should be capable of maintaining, material compliance with Equator Principle requirements and can be categorized as a "B."

Respectfully submitted,

**LEIDOS ENGINEERING, LLC**

# EXHIBIT 10

**From:** Calger, Christopher F [christopher.f.calger@jpmorgan.com]
**Sent:** 2/14/2021 6:08:06 PM
**To:** Katz, I Jeffrey [ijeffrey.katz@jpmorgan.com]; Bailly-Kermene, Leo-Paul [leo-paul.bailly-kermene@jpmorgan.com]; Harman, Stella E [stella.e.harman@jpmchase.com]; Morton, Christopher D [christopher.d.morton@jpmorgan.com]
**Subject:** RE: ERCOT

EXHIBIT
Exhibit 129
exhibitsticker.com

Agreed - I think of this as a $15B/yr market, and this one week might add $10B-$15B to that.

Chris Calger
Office: 212-834-2036
Mobile: 203-247-5489

**From:** Katz, I Jeffrey (CIB, USA) <ijeffrey.katz@jpmorgan.com>
**Date:** Sunday, Feb 14, 2021, 12:17 PM
**To:** Bailly-Kermene, Leo-Paul (CIB Risk, USA) <leo-paul.bailly-kermene@jpmorgan.com>, Calger, Christopher F (CIB, USA) <christopher.f.calger@jpmorgan.com>, Harman, Stella E (CIB F&BM, USA) <stella.e.harman@jpmchase.com>, Morton, Christopher D (CIB Risk, USA) <christopher.d.morton@jpmorgan.com>
**Subject:** RE: ERCOT

I think there are going to be a lot of ramifications.

I just did some quick numbers and I think ercot has 78k mw of capacity. Each mw is enough for 200 Texas homes according to ercots website. Previous record demand was 73.5 mw. At $35/hour that's ~$65mm/day. At $1500/hr that's ~$2.6bn/day. This could go on for a week at least.

I don't know how the power is priced and contracted for and what percent of the load would be trading at $1500, but my point is the numbers are all astronomical.

Sent with BlackBerry Work
(www.blackberry.com)

**From:** Bailly-Kermene, Leo-Paul (CIB Risk, USA) <leo-paul.bailly-kermene@jpmorgan.com>
**Date:** Sunday, Feb 14, 2021, 11:57 AM

**To:** Katz, I Jeffrey (CIB, USA) <ijeffrey.katz@jpmorgan.com>, Calger, Christopher F (CIB, USA) <christopher.f.calger@jpmorgan.com>, Harman, Stella E (CIB F&BM, USA) <stella.e.harman@jpmchase.com>, Morton, Christopher D (CIB Risk, USA) <christopher.d.morton@jpmorgan.com>
**Subject:** RE: ERCOT

Jeff, we can take care of or help with the MR section.

Is there extra info since Friday night (more GCG PNL?) or are we doing that because of exposure from some clients?

The MR senior mgmt is aware of the developments up to Friday's PNL.

---

**From:** Katz, I Jeffrey (CIB, USA) <ijeffrey.katz@jpmorgan.com>
**Date:** Sunday, 14 Feb 2021, 11:49 am
**To:** Calger, Christopher F (CIB, USA) <christopher.f.calger@jpmorgan.com>, Harman, Stella E (CIB F&BM, USA) <stella.e.harman@jpmchase.com>, Bailly-Kermene, Leo-Paul (CIB Risk, USA) <leo-paul.bailly-kermene@jpmorgan.com>, Morton, Christopher D (CIB Risk, USA) <christopher.d.morton@jpmorgan.com>
**Subject:** RE: ERCOT

A few times in the deck we should translate the technical jargon to something that people can understand - how many homes does a megawatt power an hour, for example. What's the scale of some of these wind projects, what's the size of the GRE deal in layman's terms.

For the market risk section, we should also talk about $ delta as well as megawatts/mmbtu's, obviously that's grown and that, in and of itself, is instructive.

Sent with BlackBerry Work
(www.blackberry.com)

---

**From:** Calger, Christopher F (CIB, USA) <christopher.f.calger@jpmorgan.com>
**Date:** Sunday, Feb 14, 2021, 10:58 AM
**To:** Katz, I Jeffrey (CIB, USA) <ijeffrey.katz@jpmorgan.com>, Harman, Stella E (CIB F&BM, USA) <stella.e.harman@jpmchase.com>
**Subject:** FW: ERCOT

FYI - starting to frame up a deck.

Chris Calger
Office: 212-834-2036
Mobile: 203-247-5489

---

**From:** Calger, Christopher F (CIB, USA) <christopher.f.calger@jpmorgan.com>
**Date:** Sunday, Feb 14, 2021, 10:56 AM
**To:** Smith, Conal R (CIB S&M, USA) <conal.r.smith@jpmorgan.com>
**Cc:** Wax, Brandon (CIB S&M, USA) <Brandon.Wax@jpmorgan.com>
**Subject:** ERCOT

Hey Conal,

So given the market volatility, we are going to need to pull together a deck that will describe the situation, and then get into some of the weeds on risk and economics. I'd like you to start on the first few pages that just deal with the background and high level aspects.

The overall deck s/b called ERCOT Power Market Event February, 2021

First page s/b ERCOT Market: Supply and Demand
- generic description of the market
- generation mix pie chart
- graph that shows capacity, peak demand, reserve margin
- graph that shows growth in renewables over time

Second page should be: ERCOT Market: February, 2021 Winter Storm
- weather event (severity, rarity, etc)
- supply curtailments of gas, wind and solar
- natural gas prices
- power prices

Third page s/b ERCOT Market Participants
- largest generators
- largest retailers/distributors
- other wholesale market participants
- potential issues/sources of stress (leave blank)

Please call with any questions.

Thanks,

Chris

Chris Calger
Office: 212-834-2036
Mobile: 203-247-5489

EXHIBIT
Exhibit 130

**From:** Smith, Conal R [conal.r.smith@jpmorgan.com]
**Sent:** 2/14/2021 10:09:03 PM
**To:** Calger, Christopher F [christopher.f.calger@jpmorgan.com]
**CC:** Wax, Brandon [Brandon.Wax@jpmorgan.com]
**Subject:** RE: ERCOT
**Attachments:** ERCOT Power Market Event_02.14.2021_v1.pptx; ERCOT Power Market Event_02.14.2021_v1.pdf

Chris,

Please see attached draft for you review. I am still pending some info from Paul and Chad but just wanted to send strawman across now so you have something to review. Let me know of any comments/edits at your earliest convenience.

Many thanks and kind regards,
Conal

**Conal R Smith** | Associate | Global Commodities | Investment Bank | **J.P. Morgan** | 1111 Fannin Street, Floor 11 Houston, TX 77002 | T: (713) 236-5234 | M: (347) 448-3210 | conal.r.smith@jpmorgan.com | jpmorgan.com

---

**From:** Smith, Conal R (CIB S&M, USA)
**Sent:** Sunday, February 14, 2021 10:02 AM
**To:** Calger, Christopher F (CIB, USA) <christopher.f.calger@jpmorgan.com>
**Cc:** Wax, Brandon (CIB S&M, USA) <Brandon.Wax@jpmorgan.com>
**Subject:** RE: ERCOT

Sure, will flip this afternoon.

---

**From:** Calger, Christopher F (CIB, USA)
**Sent:** Sunday, February 14, 2021 9:56 AM
**To:** Smith, Conal R (CIB S&M, USA) <conal.r.smith@jpmorgan.com>
**Cc:** Wax, Brandon (CIB S&M, USA) <Brandon.Wax@jpmorgan.com>
**Subject:** ERCOT

Hey Conal,

So given the market volatility, we are going to need to pull together a deck that will describe the situation, and then get into some of the weeds on risk and economics. I'd like you to start on the first few pages that just deal with the background and high level aspects.

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- supply curtailments of gas, wind and solar
- natural gas prices
- power prices

Third page s/b ERCOT Market Participants
- largest generators
- largest retailers/distributors
- other wholesale market participants
- potential issues/sources of stress (leave blank)

Please call with any questions.

Thanks,

Chris

Chris Calger
Office: 212-834-2036
Mobile: 203-247-5489

# EXHIBIT 11

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
AMARILLO DIVISION

| | | |
|---|---|---|
| CANADIAN BREAKS LLC, | § | |
| | § | |
| Plaintiff, | § | |
| | § | CIVIL ACTION NUMBER |
| VS. | § | 2:21-cv-00037-M-BR |
| | § | |
| JPMORGAN CHASE BANK, N.A., | § | |
| | § | |
| Defendant. | § | |

VIDEOTAPED DEPOSITION OF

KAUSHIK RAMAKRISHNAN

April 6, 2023

9:04 a.m.

1100 Louisiana Street, Suite 4100

Houston, Texas

Micheal A. Johnson, RDR, CRR

APPEARANCES OF COUNSEL

ON BEHALF OF THE PLAINTIFF
CANADIAN BREAKS LLC:

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ON BEHALF OF THE DEFENDANT
JPMORGAN CHASE BANK, N.A.:

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Alexander McLamb
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(202) 626-2957
amclamb@kslaw.com

VIDEOGRAPHER:

Claire Sjoberg

INDEX
KAUSHIK RAMAKRISHNAN
April 6, 2023

A. I can't speak to what is typical, so I can't really stack it in terms of what is typical. We may have hours that have 5 megawatt hours of generation and others that don't.

Q. Well, he seems to be referencing that that 5 megawatt hours was for the whole day, right?

A. Correct.

Q. So how does that compare to typical daily output of the wind farm?

A. I don't know.

Q. It's low, though, right? You would agree with that?

A. I couldn't tell you.

Q. Okay. All right. Do you recall having any concerns in the October 2021 -- strike that.

Do you recall having any concerns in the October 2020 time frame around the time of this icing event about Canadian Breaks' ability to perform under the JPMorgan hedge agreement?

A. Yeah, it was a nonevent. I don't really -- it wasn't something that stuck out in my mind.

Q. What do you mean by nonevent? It was unremarkable to you?

A. That's fair.

A. Correct.
Q. The ERCOT north hub is relevant for purposes of the JPMorgan hedge agreement, is it not?
A. I would say so.
Q. Was it relevant to the Cotton Plains Wind farm and the Old Settler wind farm?
A. The Old Settler wind farm, I don't recall. Cotton Plains, no.
Q. Okay. So based on that, it seems likely, then, that you're referencing the JPMorgan hedge agreement, right?
A. As I said, it's possible.
Q. What did you mean by we're unable to get our power out to the ERCOT north hub?
A. I can only think of the transmission lines and the ERCOT grid being down.
Q. What's your understanding of what the ERCOT north hub is?
A. It's a location far away from the wind farm itself where I understand it to be a liquid hub for transacting on energy contracts.
Q. What do you mean liquid hub?
A. There's plenty of volume.
Q. Is your understanding that the ERCOT north hub is a physical location?

A. I do.
Q. What is the Oncor transmission line?
A. This is part of the ERCOT grid. Every part -- certain parts of the grid are managed by certain parties and Oncor would be one of those parties.
Q. Okay. Do you have any recollection of the Oncor transmission line going down in October 2020?
A. My recollection was refreshed through the depositions.
Q. If the Oncor transmission line is down, does that mean that the Canadian Breaks wind farm is unable to deliver energy to the ERCOT system?
MR. WELSH: Objection, incomplete hypothetical.
A. No.
BY MR. LEE:
Q. Okay. Can you explain how the Canadian Breaks wind farm is able to deliver energy to the ERCOT system despite the Oncor transmission line being down?
A. Yeah. So I think of ability to deliver energy to the ERCOT system as something that's actually measurable at the wind farm. For example,

you see language that says, In sum, from Monday February 15th. Do you see where I'm reading?

A. Yeah.

Q. So it says: In sum, from Monday February 15th through approximately February 22nd, CB scheduled its deliveries for zero then trued up the schedule on a T+1 basis.

Do you see that?

A. I do.

Q. The next sentence begins: From February 9th through February 14th, CB followed the prior scheduling practice.

Do you see that?

A. I do.

Q. Do you recall that during the claimed force majeure period there was a period of time that Canadian Breaks decided to change its scheduling strategy under the hedge agreement?

A. During the force majeure period?

Q. Yes.

A. Yes.

Q. Can you describe that change for me in your own words?

A. Yeah. In the face of extreme collateral calls received from ERCOT by the project, the

decision was made to change the scheduling to zero so as to stop the collateral calls. And then subsequently, on a one-day-after basis, update the schedule to the actual generation from the wind farm.

Q. Okay. Thank you. Do you see at the beginning of this paragraph it starts, In addition CB discovered a strategy?

A. Yes.

Q. Okay. It says: In addition, CB discovered a strategy to avoid the shutdown risk by scheduling power into the market such that it eliminated CB's need to meet ERCOT's massive collateral demands.

Do you see that?

A. I do.

Q. And that's exactly what you just described, right?

A. Correct.

Q. And then the next sentence says: During February 2021 CB was in discussions with CAMS, C-A-M-S, to transition CB's wind farms' day-to-day management to CAMS from RWE.

Do you see that?

A. I do.

outages. I don't know if they're necessarily described as rolling blackouts or -- you know, the technical terms.

Q. All right. Could you explain for me how the weather prevented Canadian Breaks from performing its obligations under the JPMorgan hedge agreement?

MR. WELSH: Object to the extent it calls for a legal conclusion.

A. Yeah. Again, I can speak to it from a commercial standpoint. From my vantage point, the weather had caused -- had had significant impact on the wind farm's ability to generate power across the icing, cold temperatures and the low winds. That seriously -- that significant -- had a significant impact on generation facility itself.

And certainly there were -- there was widespread impact across Texas, you know, across the emergency declarations, across the disruption issues that I noted in the gas markets and whatnot that in turn affected the grid as a whole.

BY MR. LEE:

Q. So the weather caused issues in terms of Canadian Breaks' ability to deliver energy to the ERCOT system; is that right?

A. I can't speak to how the -- that specifically impacted Canadian Breaks wind farm, but I know how it manifested itself. And that would be in the form of extremely high pricing, extremely high collateral calls that -- you know, as we've discussed. And per the interrogatory, it prevented performance.

BY MR. LEE:

Q. Understood. Anything other than high pricing and high collateral calls that you feel resulted from the stressed power grid that then in turn made Canadian Breaks unable to perform under the JPMorgan hedge agreement?

MR. WELSH: Same objections.

A. Sorry, could you just repeat the very top question and exactly what it is that we're asking for impact on?

BY MR. LEE:

Q. Yeah. So I had asked how did the stressed power grid prevent Canadian Breaks from performing its obligations under the JPMorgan hedge agreement. And you mentioned in your response -- you referenced high pricing and high collateral calls, which I want to talk about. But other than high pricing and high collateral calls, does

under the JPMorgan hedge agreement?

MR. WELSH: Objection to the extent it calls for a legal conclusion.

A. So the extremely high pricing and the resulting -- well, let's actually take a step back and it's worth bifurcating the two. Collateral calls were issued from ERCOT and those are sort of forward-looking. And the pricing is sort of the actual, what the project actually would pay. And so the collateral calls at -- the project started receiving the collateral calls as the market entered a state of sort of disarray where the -- again, I'm no expert on the -- how that collateral mechanism is set. All we saw was really high collateral calls coming from ERCOT. I believe the dates are listed here in the rog.

And it became apparent to us that we were no longer in normal operating conditions. And, you know, a wind farm -- a single-purpose vehicle, single-purpose entity such as Canadian Breaks LLC, typically would not have the wherewithal to post that kind of collateral. And so it quickly diminished and destroyed the liquidity available at the project.

BY MR. LEE:
Q. Mr. Ramki, do you have Exhibit 188 in front of you?
A. I do.
Q. Let's go to the last page of this document, which ends in Bates stamp 855.
A. Okay.
Q. So you'll see that this e-mail chain begins on February 12th with an e-mail from yourself with the subject Canadian Breaks Liquidity Injection. Do you see that?
A. I do.
Q. And it says: Dear IC members.
Is IC investment committee?
A. That's correct.
Q. And are the people on the recipient line of this e-mail the members of the investment committee as of this time?
A. That's correct.
Q. Okay. Your e-mail goes on to say: I am writing to inform you that Canadian Breaks is experiencing an acute liquidity crunch due to the extreme weather conditions currently playing out in Texas. The project has had near zero wind resource and therefore zero generation since Tuesday night,

leaving the project to meet its generation obligations under the energy hedge by purchasing power in the open market. Let me pause there.

Was it accurate as of the time that you sent this e-mail that the project had had near zero wind resource since Tuesday night?

A. That's what I've written. I have to assume that was based on fact.

Q. Your e-mail does not mention any icing. If there had been icing, do you think that you would have mentioned that in your e-mail?

A. I believe I've captured that in the extreme weather conditions, which would include things like icing.

Q. Okay. But sitting here today, do you know whether for a fact there had been any icing at the Canadian Breaks wind farm as of February 12th?

A. I don't know that for a fact. Not to suggest there couldn't have been.

Q. Well, let's turn two pages before this. In the bottom half of the page there's a February 12th e-mail from George Zakem. Do you see that? It says: Kash will give a fuller debrief?

A. Yes.

Q. His -- so the third sentence of that

(Discussion off the record.)

BY MR. LEE:

Q. Okay. Mr. Ramki, your e-mail at the top of page 1 of Exhibit 185 says: Jamie, George, FYI we are seeing a spike in our collateral posting requirements at Canadian Breaks due to severely cold weather in Texas and zero wind at our site. As a result, we are being forced to buy power at $200 to $2,000 per megawatt hour to meet our obligations under our energy hedge. Let me pause there.

I assume you're referring to the JPMorgan hedge agreement when you say under our energy hedge?

A. That would be correct.

Q. Okay. Reading on, it says: Due to the, quote, expected, end quote, losses, the project needs to post an incremental $2.5 million of collateral with ERCOT, getting our total collateral posted to $4 million. We have sufficient capital at the asset to meet these calls and Travis and I have been squirrelling funds away -- funds a couple of levels higher for just such a scenario. Let me pause there.

What did you mean when you said that Travis and I have been squirrelling away -- squirrelling funds away a couple of levels higher

BY MR. LEE:

Q. Yeah. And I understand where the disconnect is now.

So Canadian Breaks scheduled zero is what this e-mail says, right?

A. That's my understanding, yes.

Q. Right. So JPMorgan did not receive energy from Canadian Breaks at the ERCOT north hub on February 14th, right?

A. As I explained it, yeah, that's -- that would make sense under normal operating conditions.

Q. Well, on February 14th, due to a clerical error, Canadian Breaks scheduled zero it says. And so --

MR. WELSH: Objection -- sorry.

BY MR. LEE:

Q. And so Canadian Breaks delivered zero megawatts to JPMorgan on February 14th, right?

MR. WELSH: Objection, foundation, document speaks for itself.

A. Applying the traditional scheduling mechanism here for the 14th, that logic makes sense.

BY MR. LEE:

Q. Okay. But the partial performance is a redirecting of revenue to JPMorgan even though

Canadian Breaks did not deliver energy to JPMorgan at the north hub, right?
A. That's correct.
Q. So would you agree that post -- I'll withdraw the question and start over.
Would you agree that payment of revenue to JPMorgan is a way to perform under the JPMorgan hedge agreement, even if energy is not actually delivered to JPMorgan?
MR. WELSH: Objection, calls for a legal conclusion, incomplete hypothetical.
And you can only answer the question to the extent your understanding wouldn't be informed by discussions with counsel about the force majeure term and performance under it.
THE WITNESS: Yeah.
A. Outside of the force majeure environment, if this were to occur, I don't think this is a normal operating sort of approach to it, so maybe the parties would settle bilaterally, as is being proposed here.
BY MR. LEE:
Q. Right. At least as of February 15th at the time you sent this e-mail, your intention was to perform to the best of Canadian Breaks' ability --

A. Correct.

Q. -- by redirecting revenue for energy that was not delivered, right?

A. Correct, yes. And just to clarify on that point, delivered under the contract. It was delivered to the ERCOT system.

Q. Okay.

MR. LEE: We'll mark as Exhibit 193 a one-page document with Bates stamp CB008117.

(Deposition Exhibit 193 marked for identification.)

BY MR. LEE;

Q. Mr. Ramki, this appears to be a message of some sort dated February 15th, 2021, from yourself to Mr. Isbister. It reads: This is effectively to force all generators to remain available to generating at ERCOT's behest.

Do you see that?

A. I do.

Q. Is this a chat? Is this an e-mail; do you know? Do you happen to recognize this format?

A. The primary mode of communication is e-mail, and it looks like an e-mail.

Q. All right. Do you have any idea what you're referencing here?

February 20th, 2021. Is that just because the price was negative that day?

A. That sounds right to me.

Q. Or I guess over the course of the day it was more negative than positive based on the times that the wind farm was generating, I guess?

A. Correct. On a generation-weighted basis, the realized nodal price would have been negative for the 20th.

Q. I believe in Canadian Breaks' pleadings in the case I've seen figures saying that the average annual revenue is about $15 million. Does that sound about right to you for that period of time?

A. That sounds about right to me.

Q. So some of these numbers are significant. They're actually above $15 million for a single day's worth of production. So I'm looking at February 16th, for example. Looks like the wind farm made more than $28 million that single day?

MR. WELSH: Objection, ambiguous.

BY MR. LEE:

Q. Is that correct?

A. The nodal sales on the 16th based on the ERCOT -- prevailing ERCOT pricing at the time

resulted in 28 million of nodal sales.

Q. To your knowledge, is that the highest single day nodal sales figure in the history of the wind farm?

A. I don't know that for a fact because, as I noted, this is only half of the revenue piece. The other piece is -- effectively a lot of this money would go back to JPM.

Q. Understood. But in terms of just the gross revenue from the nodal sales alone in isolation, do you believe that this is likely the single highest revenue figure the wind farm has ever seen in its history?

A. Yeah, because the prevailing prices were $9,000 a megawatt hour, which has never been seen in the history of this project or, I believe, ERCOT on such a long basis.

Q. And so during Canadian Breaks' force majeure period, in terms of gross nodal sales in isolation, it made over $47 million over this 11 or 12-day period, correct?

MR. WELSH: Objection to form.

A. It didn't make it. It just realized it. It then in turn paid that -- a good chunk of that to JPMorgan.

BY MR. LEE:

Q. So I want to ask about the next column to the right, Daily Net Loss with Hedge Quantities. Can you explain to me what these numbers represent?

A. Yeah. That -- that is actually the loss, true revenue for the project after accounting for the hedge quantities that you would deliver at the node under the energy hedge. So, yeah, it's a negative revenue for the project through that period.

Q. Let me unpack that a little bit. Are these figures under Daily Net Loss with Hedge Quantities for the full hedge quantities or only for the partial hedge quantities that matched Canadian Breaks' actual generation?

A. I'll have to look at the calculations specifically, but I think this is illustrative of what the true loss would have been had it scheduled the full quantities. It's a box within force majeure to signify that that's not actually what may have happened.

Q. Okay. I'm not -- and I don't know one way or the -- one way or the other, but that number strikes me as low, because I know that the replacement price invoices for February 14th to the

19th alone totaled $79 million.

Do you recall the replacement price invoices, the accelerated damage invoices, totaling $79 million from JPMorgan?

A. I believe the first set were and then subsequently I think updated to maybe 81, 82 million.

Q. Right. And here it says 37 million. So that suggests to me at least that this was not the full hedge quantities.

A. I think it --

MR. WELSH: Is that a question? Hold on.

THE WITNESS: Yeah. Sorry.

A. Is there a question?

BY MR. LEE:

Q. Yeah. I mean, so in light of the fact that you recall the replacement price invoices being in the magnitude of $80 million, does that change your opinion about whether this column reflects full hedge quantities versus just partial performance tied to actual generation?

A. It does not. The loss noted here is in line with what the project would have faced as negative revenue for the entire year -- for that

one-week period had it, you know, scheduled the full hedge quantities and followed through.

Q. Okay. Let me ask you this. So that column, are you saying that it is cumulative, meaning it already takes into consideration the nodal sales?

A. That's what I'm saying.

Q. Okay. So with the full hedge quantities having -- assuming that they had been scheduled, even despite the $47.4 million in gross nodal sales, Canadian Breaks would have lost $37.4 million. Do I have that right?

A. That's exactly right.

Q. Now I understand the chart. Okay. Thank you for clearing it up for me.

MR. LEE: Okay. We'll mark as Exhibits 199 and 200. Exhibit 199 for the record is a document that begins CB029203.

(Deposition Exhibit 199 marked for identification.)

MR. LEE: And Exhibit 200 is the attachment to that document, beginning Bates number CB029206.

(Deposition Exhibit 200 marked for identification.)

Mr. Ramki, do you recall that in February of 2022 Canadian Breaks made a payment under protest to JPMorgan?

A. Yeah. This is why I don't believe it extended.

Q. I assumed that.

A. Yeah.

Q. Who funded that payment under protest?

MR. WELSH: Objection, ambiguous.

A. The project funded it, but the cash would have come from Northleaf in this case.

BY MR. LEE:

Q. Canadian Breaks LLC did not have the cash sitting in its accounts or on its balance sheet to make the payment under protest on its own?

A. That is correct.

Q. Do you know when that cash was injected by Northleaf into Canadian Breaks LLC?

A. That's a good question, because the cash, I believe, I stand to be corrected if the facts suggest otherwise, that cash would have been transferred directly to JPMorgan from Northleaf; whereas the paper trail would suggest that Canadian Breaks ultimately paid that to JPMorgan. So I don't know if it ever went to Canadian Breaks, the entity

CERTIFICATION

I, Micheal A. Johnson, Registered Diplomate Reporter and Notary Public in and for the State of Texas, do hereby certify:

That KAUSHIK RAMAKRISHNAN, the witness whose examination is hereinbefore set forth, was first duly sworn by me and that this transcript of said testimony is a true record of the testimony given by said witness.

I further certify that I am not related to any of the parties to this action by blood or marriage, and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 6th day of April, 2023.

Micheal A. Johnson

MICHEAL A. JOHNSON, RDR, CRR
NCRA Registered Diplomate Reporter
NCRA Certified Realtime Reporter

Notary Public in and for the
State of Texas
My Commission Expires: 8/8/2024

# EXHIBIT 12

UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF TEXAS

AMARILLO DIVISION

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| | | |
|---|---|---|
| CANADIAN BREAKS LLC, | ) | |
| | ) | |
| Plaintiff, | ) | |
| | ) | Case No. |
| vs. | ) | |
| | ) | 2:21-cv-00037-M-BR |
| JP MORGAN CHASE BANK, N.A., | ) | |
| | ) | |
| Defendant. | ) | |
| ______________________________ | ) | |

CONFIDENTIAL

MONDAY, MARCH 13, 2023

VIDEOTAPED DEPOSITION OF

CHAD STROBERG

VIA REMOTE VIDEOCONFERENCE

Stenographically Reported by:
Victoria L. Valine, CSR, RMR, CRR, RSA
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Videographer: Andrew Holmes

(All parties appeared remotely via videoconference.)

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EXAMINATION BY COUNSEL

BY MR. WELSH:

**Q. And what was the expected -- do you know the expected ROE on the -- on that transaction? Has it closed -- the Canadian Breaks hedge, has it closed?**

A. I don't, offhand. I don't remember.

**Q. Going to page 8, which is the forward curve for ERCOT North Hub. Let me know when you're there, please. Exhibit 46.**

A. I'm here.

**Q. How does JPM calculate -- just in big picture terms -- the forward curve for the purposes of analyzing whether to enter a hedge?**

MR. LEE: Object to the form.

THE WITNESS: Whether it be in a physical or financial markets that are traded, we get clarity on that, and then, as you get out the curve, there are some assumptions that are made in less liquid portions of the curve.

BY MR. WELSH:

**Q. So here it looks like there's about six years of historical data on page 8 of slide 8 showing pricing ranging from -- you know, under $20 a megawatt hour up to about $100 a megawatt hour; is that correct?**

A. That looks correct, yes.

**Q. Who prepares these forward curves at**

**J.P. Morgan?**

MR. LEE: Object to the form.

THE WITNESS: I mark the forward curve at J.P. Morgan for ERCOT.

BY MR. WELSH:

**Q. Do you work with any other institutions in creating a forward curve that you guys use, financial analysts, or anything like that, outside of J.P. Morgan?**

A. No. This is the curve that I -- that I mark every night.

**Q. And so, just big picture, it looks like you anticipated electricity rates would drop between 2019 through 2033; is that correct?**

A. In this graphic, that is correct.

**Q. And it looks like that you -- your curve, it looks like, shows an average of -- what's the average on here for the duration of the potential hedge?**

**Is that shown by the dotted line?**

MR. LEE: Object to the form.

THE WITNESS: I'm not sure. What was your question again?

BY MR. WELSH:

**Q. Sure.**

**What do you -- what are you marking the average expected megawatt cost to be during the duration of the**

**hedge agreement through 2033?**

MR. LEE: Object to the form.

THE WITNESS: I don't think you can tell from this. I mean, the dotted line, I believe -- and, I mean, my recollection is, the average of the realized price. So it's the average of those prices between January of 2012 through January of '18.

BY MR. WELSH:

**Q. When you mark the curve, do you consider the potential for scarcity pricing?**

A. I mark the curve based on where I see the market which, in my view, has some implied scarcity price in it, yes.

**Q. All right. And the -- so the maximum megawatt -- the maximum dollar per megawatt hour that you have marked here on this curve from 2018 through 2033 appears to be in year one and it appears to be around $60 a megawatt hour; is that correct?**

MR. LEE: Object to the form.

THE WITNESS: That top -- I don't know if you call it mountain top between 2018 and 2019 appears to be about $60.

BY MR. WELSH:

**Q. And then for the duration of the curve that you marked on slide 8 it appears to drop down to the $50**

**megawatt hour range; is that correct?**

A. Yes. That looks about correct.

**Q. Now, you have risks on the very last page of the slide -- I may have asked you this, I apologize, but did you prepare this presentation?**

A. I believe I was the -- yes. I believe I was the primary on this presentation.

**Q. All right. So you have other -- other risks -- current and future risks to consider for this deal on the last slide, correct?**

A. Yes.

**Q. And what did you mean by "regulatory risk," the fourth bullet point down?**

A. I don't recall exactly, but I -- if I was surmising, maybe something with rules changing within ERCOT.

**Q. Sitting here today, do you have any rules in mind?**

A. No I think this was just a high level if they were to change rules. It's something that we were exposed to.

**Q. In what sense would JPM be exposed?**

A. I mean, it's a -- this is all very hypothetical. If they -- if they changed the price cap, for example.

**Q. Do you know what the price cap was in 2018?**

A. I believe it was still 9,000 at the time.

**Q. What's the current price cap?**

A. 5,000.

**Q. And you understand historically it's been -- before it was 9,000 it was 5,000, is that your recollection of where it was before it bumped up?**

MR. LEE: Object to the form.

THE WITNESS: I don't remember exactly how the path has gone. I know where it is currently, and I believe it was -- I know where it was several years ago. Prior to that, I don't -- and how it got there, I don't remember if there was a step or not.

BY MR. WELSH:

**Q. In your modeling of the Canadian Breaks hedge agreement, do you recall in any way modeling potential prices exceeding $1,000 a megawatt hour?**

MR. LEE: Object to the form.

THE WITNESS: I don't -- I don't believe -- I don't remember doing that, no.

BY MR. WELSH:

**Q. You would agree with me that $1,000 for a megawatt hour of electricity is extraordinarily expensive, correct?**

MR. LEE: Object to the form.

THE WITNESS: I think it -- in general, yes. But there will be times when supply and demand is tight where that is -- that is how the market is set up is to price accordingly, so to incentivize people to turn on to balance the grid.

BY MR. WELSH:

**Q. And by balancing the grid, you mean to deliver electricity to customers?**

A. By balancing the grid, I mean allowing it to function so that frequency doesn't drop below where power plants have issues.

**Q. What's your -- do you have a detailed understanding of how that works or just sort of high level understanding?**

MR. LEE: Object to the form.

THE WITNESS: Very high level.

BY MR. WELSH:

**Q. Very high level.**

**So you have low probability risks here, and you got gas basis risk. Can you explain that?**

A. We would be -- we would be hedging our gas at Henry Hub, but the gas for ERCOT is probably -- locationally is probably more Houston Ship Channel is a more accurate representation. So if those two prices were to diverge, we would be exposed to some risk if we were

BY MR. WELSH:

**Q. Do you know how long it lasted, that storm in 2011?**

A. I don't recall.

**Q. Do you remember any storms in the year -- winter storms occurring in the year 2018 that had an impact -- when did you start trading, 2016, right?**

A. Yeah. Late 2016.

**Q. Do you remember any storms in 2016 that had a significant impact on pricing in the ERCOT market? Winter storms.**

A. I -- I don't remember.

**Q. 2017?**

A. I don't remember.

**Q. 2018?**

A. You just asked me that, but I don't remember.

**Q. 2019?**

A. Not for cold on that -- in 2019, no.

**Q. 2020?**

A. No.

**Q. 2021?**

A. Yes. I remember this storm.

**Q. Any others, other than Winter Storm Uri?**

A. Not since I began trading power to the -- in winter, no.

they're asking them to, you know, remove 10,000 megawatts of demand.

BY MR. WELSH:

**Q. And the demand comes from consumers -- people or businesses, correct?**

MR. LEE: Form.

THE WITNESS: Most likely, yes.

BY MR. WELSH:

**Q. All right. So when you just -- when you make a trade on the ERCOT system and the supply -- the demand exceeds the supply, how do you know whose trade is curtailed versus whose trade is fulfilled?**

MR. LEE: I'll object to the form of the question.

THE WITNESS: That's -- I don't know that. I think that's more of a -- you know, granular question that I don't have the expertise to answer.

BY MR. WELSH:

**Q. So if you -- if you scheduled to deliver, during Winter Storm Uri -- "you" meaning J.P. Morgan -- 100 megawatts of electricity to BP during a period of high curtailment, how do you know if that 100 megawatts of electricity was actually delivered to BP or not as a matter of the actual electrons being sent to a delivery point?**

**How would you know that given the curtailment that has occurred?**

MR. LEE: Form.

THE WITNESS: One, I think you don't know where -- the electrons don't go from J.P. Morgan to BP. They just go into the system. So I don't -- I don't think you can track that. But I don't want to answer something that -- honestly, that I don't know enough about to answer that question.

BY MR. WELSH:

**Q. So you don't know, one way or the other, if, when you scheduled on behalf of JPM to deliver 100 megawatts to BP during periods of high curtailment during Winter Storm Uri, you don't -- you can't sit there and say that that electricity wasn't curtailed -- wasn't not delivered as part of the energy that was curtailed systemwide by ERCOT?**

MR. LEE: Objection. Misstates prior testimony.

Go ahead, Chad.

THE WITNESS: We scheduled our firm obligation. I don't -- from where -- from there ERCOT manages the grid, and I don't know exactly what they do with that -- however they do it. Whatever they can do to balance the grid, that's what their role is.

BY MR. WELSH:

**Q. So you can't tell me, sitting here today, who receives the electrons that they bought versus who doesn't exceed the electrons they bought in a situation where there is significant systemwide curtailment, correct?**

MR. LEE: Objection to the form of the question. Misstates prior testimony.

Go ahead, Chad.

THE WITNESS: I think in -- in any time we schedule we don't -- you can't say where the electrons go.

BY MR. WELSH:

**Q. Or if they're delivered at all in the case of exceedingly high curtailment, correct?**

MR. LEE: Objection to the form.

THE WITNESS: Again, I don't -- on the curtailment question, I don't know specifics on that. I know that when we schedule that power, at any time, you can't say exactly where that electron goes.

BY MR. WELSH:

**Q. And when you schedule the power in a situation where -- where there is -- where there are blackouts and demand exceeds supply, somebody isn't getting the electricity that they paid for; isn't that true?**

MR. LEE: Objection to the form of the question.

"ERCOT will implement the pricing --"

The first -- do you see the paragraph that starts with "First"?

A. Yes.

Q. In the third sentence so, you know, the second sentence references the 9,000 megawatts, $10,000 per megawatt hour, and then it goes on to say,

"ERCOT will implement the pricing outcomes directed by the order by making an administrative adjustment to the generation to be dispatched value and the realtime reliability deployment price at or process during all the intervals in which ERCOT has directed firm load shed."

Do you see that language?

A. Yes, I do.

Q. So can you explain to me what the realtime reliability deployment price adder is?

MR. LEE: Objection to the form.

Go ahead.

THE WITNESS: So ERCOT -- this is getting back to our earlier discussion. These are price adders that is part of the pricing equation for ERCOT. When

supply/demand gets tight, they put in -- they have these price adders to incentivize generation to come online at higher prices.

BY MR. WELSH:

**Q. So as demand is ratcheted up, this RD realtime reliability deployment price adder is a charge that's added to the price of the electricity, is that what you're saying?**

MR. LEE: Form.

THE WITNESS: It's -- it's a component of the pricing in ERCOT.

BY MR. WELSH:

**Q. And it's attached to -- so demand is ratcheted up, and then this charge, this adder is charged -- is added to the price of the electricity, is that how it generally works?**

MR. LEE: Form.

THE WITNESS: At a high level, that is my understanding, yes.

BY MR. WELSH:

**Q. All right. And, historically, are you aware of whether or not this realtime reliability deployment price adder has been used for the purposes of scarcity pricing in the ERCOT market?**

MR. LEE: Form.

THE WITNESS: It comes into play quite often, actually.

BY MR. WELSH:

**Q. And can you give me some examples that you recall that predate Winter Storm Uri?**

MR. LEE: Form.

THE WITNESS: I know -- I know in the summer of 2019 it was very prevalent, but on a day-to-day basis, we often see it -- it may be a small amount here or there, but every five minutes we can see some of that adder come into play if supply/demand gets tight for a short period of time or for a longer period of time.

BY MR. WELSH:

**Q. And in your -- so this is a realtime adder that you have seen used even in situations where there is no scarcity, or is this just tied to scarcity pricing?**

**I'm sorry. I'm confused.**

A. It only applies when supply/demand gets above a certain threshold in the formula for ERCOT pricing.

**Q. Now, do you have a sense during -- during the Winter Storm Uri period, what percentage of the electricity pricing was attributed to this ratcheted demand adder -- this realtime price deployment adder?**

MR. LEE: Form.

THE WITNESS: I don't know offhand, no.

BY MR. WELSH:
**Q. And so, as a historical matter, has your observations of this -- have you heard it referred to as the RTRDPA adder?**
A. Not specifically. No, I have not.
**Q. Do you have any idea how ERCOT determines that price that will be associated with -- a charge that will be associated with the RTRDAP [sic] adder?**
MR. LEE: Form.
THE WITNESS: It's -- like I said before, it's a fairly complicated formula. At a very high level, as I said, as supply/demand gets higher, the adder kicks in and adds more value as supply/demand gets tighter and tighter.
BY MR. WELSH:
**Q. Do you know, when you do your -- when you did your forward curve in the 2018 timeframe associated with the Canadian Breaks hedge, did you model into your forward curve the potential cost associated with R -- the RD -- the RTRDPA adder?**
A. Yes. The forward curve takes into account the probability for scarcity events.
**Q. And what -- do you recall what probability you associated with the potential for a scarcity event in the forward curve associated with the Canadian Breaks hedge?**
MR. LEE: Object to the form.

THE WITNESS: Okay. I think that's enough for me.

MR. LEE: Yeah. We got up to 2 minutes and 38 seconds.

THE WITNESS: Yeah.

BY MR. WELSH:

**Q. So, this is an audio recording during the Winter Storm Uri time period between you and who?**

A. Philip Carey.

**Q. Who is he?**

A. He is -- he was -- he's an originator for --

**Q. For J.P. --**

A. Yeah. He works at J.P. Morgan, correct.

**Q. And does he still work there?**

A. Yes.

**Q. And in which office?**

A. He's in Houston.

**Q. How long has he been with J.P. Morgan, to your knowledge?**

A. I think he was hired in -- I want to say 2018 is my best guess.

**Q. Did you review this audio or a transcript of it in preparation for your deposition?**

A. No.

**Q. All right. So at the beginning of the audio**

you characterized the market as "bonkers"; isn't that true?

A. That's what I said.

Q. And you were referring to the ERCOT market?

A. I was referring to the pricing in the market, yes.

Q. Yeah. And you would agree with me that bonkers is not normal, correct?

A. I would agree with that.

Q. I also think you called the ERCOT market "nuts"; is that right?

A. I believe that's what I said after "bonkers," yes.

Q. And you also said that people were being carried out on stretchers; isn't that true?

A. I did say that.

Q. And you were referring to people who were Reliant on the ERCOT market; is that correct?

A. No. I was referring to people who were short power.

Q. Meaning they were being carried out on stretchers?

A. Meaning like they were losing a lot of money. That was what the -- that's what the saying was implying.

Q. And does Philip go by JP? Is that the same

BY MR. WELSH:

**Q. And people have to buy power at that rate, that would -- that would have a big impact on them, too, correct?**

MR. LEE: Object to the form.

THE WITNESS: Potentially if they -- again, if they were short power and needed to buy, I think I'm saying the same thing.

BY MR. WELSH:

**Q. Well, what about your average business or average customer, they're not immune from this pricing, are they?**

MR. LEE: Object to the form.

THE WITNESS: So, yeah. Actually they -- almost all of them are, because we're talking about -- this is a wholesale power price, and your businesses are at a retail level, and almost all of those are locked in for term at very low prices.

BY MR. WELSH:

**Q. And you don't know --**

A. They don't flow with the market price.

**Q. They eventually adjust, though, on market price, correct?**

MR. LEE: Object to the form.

THE WITNESS: Well, as we saw, after this event, the prices that you could then -- so, in Texas you

A. I think the context would say that's correct. I just don't know which day.

**Q. At this point, you've been out of power for 36 hours; is that right?**

A. In my house, that's what I said, yes.

**Q. Okay. Does that refresh your recollection about when this call occurred?**

A. Sometime during Uri. I'm don't know which day it was, though.

**Q. Did you lose power during that weekend -- during the Presidents' Day weekend on Valentine's Day or Presidents' Day, do you remember?**

A. I don't remember when we first lost power, because it would come on and off, and then went off for awhile. I don't remember exactly.

**Q. All right. You referred to the events as a shit show; is that right?**

A. I did say that.

**Q. And a shit show is somewhat synonymous with the language you used earlier as a disaster; is that fair to say?**

MR. LEE: Form.

THE WITNESS: Yeah. I mean, it's the same thing I've been saying all along. What was happening in Texas was not ideal.

BY MR. WELSH:

**Q. And you referred to it as really, really bad, correct?**

A. Yeah. People losing their lives and not having power or water, that's really bad.

**Q. You were also referring to market conditions as a nightmare; isn't that true?**

MR. LEE: Form.

THE WITNESS: I don't know that that's necessarily true. I think the nightmare I was more referring to the humanitarian issues.

BY MR. WELSH:

**Q. Also, when you said everything -- or your colleague said, "everything has failed here," and then you said, "I agree. A combination of everything."**

**"Everything" means everything, does it not?**

A. I --

MR. LEE: I'll object to the form.

Go ahead.

THE WITNESS: I can't -- I think what I meant by that is there's a combination of factors. It wasn't just one thing that was causing the grid to have issues.

BY MR. WELSH:

**Q. You also talked about issues in terms of the**

MR. LEE: Form.

THE WITNESS: I don't know that. I don't think -- I can't speculate on that.

MR. WELSH: Okay. You can listen to the audio and let me know when you're done.

THE WITNESS: Sure. Okay. 73 is what you want? Is that what we're on?

MR. WELSH: I'm sorry. Yeah. Hold on.

Was it uploaded or no? Yeah. It's uploaded.

THE WITNESS: I just -- while we were talking I think it got uploaded. So 73 is the right one?

MR. WELSH: Yes. Yes, sir.

THE WITNESS: Okay.

Okay. We're done.

BY MR. WELSH:

**Q. This is a call between you and Philip, one of your colleagues at J.P. Morgan, correct?**

A. That's correct.

**Q. And do you think this date -- do you think this is Friday, February 12th?**

A. I don't know the exact date, but I think that might be -- that may be the case.

**Q. It's sometime during Winter Storm Uri, correct?**

A. Yes.

**Q. And one of the issues, you started the call by**

**discussing gas delivery issues which you said were real, correct?**

A. To my understanding, yes. The gas delivery issues were real.

**Q. And that was having an impact on energy pricing?**

A. Yes. That's my understanding.

**Q. A negative impact on energy pricing making it go --**

MR. LEE: Object to form.

BY MR. WELSH:

**Q. -- making it go higher?**

A. Gas prices higher would generally mean higher power prices, correct.

**Q. And that's what you were observing realtime during this delivery issue -- gas delivery issue during Uri, correct?**

A. I think that was one of the factors that played into higher prices.

**Q. And then there was a reference that was made to something about being up by $25 million.**

**Can you explain that?**

A. That was how much the national gas desk was up, I think in the middle of the day. I don't know what it ended up being.

**Q. All right. Well, he asked you is the market still hyped up, correct?**

A. Yes. And same as I said for the other points in time it's -- I exasperated said, "yes. It's crazy."

**Q. You were laughing when he asked you if the market was hyped up, correct?**

A. Again, I'll explain. My laughing is not laughing at things. It's like exasperating, if you will.

**Q. So you're not -- you weren't laughing in this audio recording?**

MR. LEE: Rick, I'll just object. The recording speaks for itself. Everybody can listen to it and, you know, see if he was laughing or not. He just explained the situation.

I think we should move on.

BY MR. WELSH:

**Q. So right after you laughed, whether it was an exasperated laugh or an utter laugh, that's when you said that the gas desk was up $25 million, correct?**

A. Yes. After that I said we were up 25 million.

**Q. And your colleague said "awesome," correct?**

A. Philip said that, yes.

**Q. All right. And these $25 million in profits, these were at least, in part, a result due to the gas delivery issues that were occurring in Texas during Winter**

**perfect storm."**

**Do you see that language?**

A. I see where it says that.

**Q. And would you agree that's consistent with your statements that you made to your colleague, Philip, that everything had failed -- everything here had failed in Texas during the Winter Storm Uri period?**

MR. LEE: Object to the form.

THE WITNESS: I don't believe I said that the market failed. I said that it was a myriad of issues with the grid, but I don't believe I said the market failed.

BY MR. WELSH:

**Q. Well, you used the word "everything," correct?**

A. Everything -- there was a lot of issues, I think I said, or there was a lot of different things playing into it.

**Q. All right.**

MR. WELSH: I'd like to mark as Exhibit 82 the Potomac -- the IMI Report. Let's see if I can help find it.

Andrew, are you able to find the report? I forget what it's called, but it might be IMI Report.

THE VIDEOGRAPHER: I don't seem to have a document named that, Counsel. I have one called IMM Follow-Up Letter.

UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF TEXAS

AMARILLO DIVISION

--o0o--

CANADIAN BREAKS LLC, )
)
Plaintiff, )
) Case No.
vs. )
) 2:21-cv-00037-M-BR
JP MORGAN CHASE BANK, N.A., )
)
Defendant. )
_________________________________ )

REPORTER'S CERTIFICATION

MONDAY, MARCH 13, 2023

VIDEOTAPED DEPOSITION OF

CHAD STROBERG

I, Victoria L. Valine, Certified Shorthand Reporter No. 11743 in and for the State of Texas, hereby certify to the following:

That the witness, CHAD STROBERG, was duly sworn by the officer and that the transcript of the oral deposition is a true record of the testimony given by the witness;

That the original deposition transcript was

delivered to __________________________;

That the copy of this certificate was served on all parties and/or the witness shown herein on __________________________;

I further certify that pursuant to FRCP Rule 30(f)(1) that the signature of the deponent:

Was not requested by the deponent or a party before the completion of the deposition.

I further certify I am neither counsel for, related to, nor employed by any of the parties or attorneys in the action in which this proceeding was taken, and further that I am not financially or otherwise interested in the outcome of the action.

Certified to by me this 20th day of March, 2023.

Victoria L. Valine

________________________________
Victoria L. Valine, CSR, RMR, CRR
Texas CSR No. 11743
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San Diego, California 92101
619-546-9151

DECLARATION UNDER PENALTY OF PERJURY

Case Name: Canadian Breaks LLC vs.
JPMorgan Chase Bank, N.A.
Date of Deposition: 03/13/2023

Job No.: 10116926

I, CHAD STROBERG, hereby certify under penalty of perjury under the laws of the State of ________________ that the foregoing is true and correct.

Executed this ______ day of __________________, 2023, at ____________________.

_________________________________
CHAD STROBERG

NOTARIZATION (If Required)

State of ________________

County of _______________

Subscribed and sworn to (or affirmed) before me on this _____ day of ____________, 20__, by________________________, proved to me on the basis of satisfactory evidence to be the person who appeared before me.

Signature: ______________________________ (Seal)

# EXHIBIT 13

**From**: Stroberg, Chad [chad.stroberg@jpmorgan.com]
**Sent**: 2/18/2021 10:08:22 PM
**To**: Katz, Benjamin [benjamin.katz@jpmorgan.com]
**Subject**: FW: Texas (ERCOT) Weather/Forecast Headlines - 2/18/2021
**Attachments**: image002.png; image004.jpg; CWG_ERCOT_solar_210218.pdf; image024.png; CWG_ERCOT_wind_210218.pdf; image023.png; image008.png; image005.jpg; image001.png

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**From:** Janish, Paul R (CIB, USA)
**Sent:** Thursday, February 18, 2021 4:08:11 PM (UTC-06:00) Central Time (US & Canada)
**To:** Janish, Paul R (CIB, USA)
**Subject:** Texas (ERCOT) Weather/Forecast Headlines - 2/18/2021

STROBERG
EXHIBIT
51
Victoria L. Valine, CSR, RMR, CRR
Stenographic Court Reporter
Texas CSR No. 11743 3/13/2023

*See attached for short term forecast updates of Solar and Wind Power Gen from CWG*

## Texas (ERCOT) Weather Headlines

- **Severe Arctic Cold and Winter Weather Stresses ERCOT Grid to the Point of Breakdown**
- **Arctic Cold to Linger the Next Few Days as Snow/Winter Mix Gradually Ends Across West, Central and East TX**
- **Load Recover to Above 60 GW Expected Friday with Lingering Wind Power Gen Curtailments Expected Friday**
- **ERCOT Pricing Chaos Could Linger Next Few Days as Demand/Supply Complexities are Sorted Out**
- **ERCOT Load Expected to Gradually Fall to Below Normal by Mid-Next Week Lingering Into Early March**
- **Wind Power Gen is Expected to Ramp Above Normal Mid-to-Next Week**
- **Combined Load/Generation Trends Should Support Bearish ERCOT Price Response by Mid-Next Week Into Early MAR**
- **Some Colder Risk Is Possible by Early MAR But Widespread Return of Arctic Cold is NOT Expected**

## Forecast Discussion:

When I wrote my Texas Forecast Discussion last Friday, I was concerned I was being a bit too alarmist given ***anticipated extreme cold risk and impact*** expected across the state going into the weekend and this week. Sadly, it couldn't have been strong enough. The major calamity across the ERCOT power grid and extreme gas burn used for power supply and residential/commercial heating over the past week has ***been record breaking by almost every metric.*** The ***initial onslaught of arctic air*** which arrived ***faster and stronger*** than most models predicted (making navigation of reality vs. the model difficult at times) led to significant demand out performance as early as last Wed/Thu with ***wind and solar power gen curtailments increasing and expanding over the weekend*** as arctic air and winter storminess (snow, sleet, freezing rain) expanded across the state. The situation was *elevated to critical and borderline catastrophic* as ***cold air plunged stronger, lingering longer*** with ***record cold and demand exceeding 150% of the previous all-time cold*** for this period (on a GWHDD basis) resulting in *more impactful cold than ever seen across Texas, eclipsing records going back more than 125 years*. Renewable energy curtailments, natural

Appx. 00482

gas and other fuel derived power plant freeze-ups, loss of water, burst pipes, lack of natural gas supply/pressure, and other exogenous event all led to a ***cataclysmic power failure at times across the state with over 4.5 million customer left without power (10-15 million people) for extended periods of time*** during one of the coldest outbreaks in modern times. There were numerous carbon monoxide fatalities, reckless residential fires caused by desperate attempts to generate heat, and numerous fatalities caused by people out on icy roads in search of friends/relatives with power only to get caught in dangerous travel conditions. Numerous reports of burst pipes with ***well over 1 million homes likely experiencing water damage*** and ***insured losses likely to eclipse $1 billion (my caveman estimate) are likely to result***. Shortages on food supplies and water at stores, long lines at hardware/home improvement stores, lack of propane or gasoline at many facilities, contaminated water supply due to low water pressure, and mandatory closure of restaurants given contaminated water supply have all resulted in a ***post CAT 3 hurricane feel*** around the state with impact far reaching from the coast and ***most damage done to the interior vs. exterior of homes.***

**Freezing temperatures** and a ***continuation of arctic cold is forecast to linger*** across much of Texas the next few days with *snow/winter mixed precipitation* across parts of west and south-central/central and east TX gradually ending tonight. ***Cold pattern flexing*** has ***lingered stronger and longer than forecast by ANY of the medium range models last week*** with ***below normal temps expected to persist***, but ***gradually moderate*** into early next week. *Warmer temperatures* are expected to return by ***mid-next week*** with *aboves* likely returning and *highs in the 70s* for major hubs forecast. A rather ***variably progressive flow regime*** across the U.S. going into the end of the month and early MAR should ***keep any expansive aboves or belows from returning*** with durability across Texas accompanied by periods of *storminess* at times. <u>*Much above normal demand above 60 GW tomorrow*</u> is expected to <u>*gradually wane*</u> going into the weekend and early next week as *temperatures moderate*. <u>*Below normal load*</u> is ***forecast by mid-next week*** and ***linger into early MAR*** based on current temperature expectations ***(Fig. 4b).*** *Wind power gen curtailments* are forecast to continue today/Fri, then *ramp much higher with stronger winds* over the weekend. *Below normal wind power gen* is forecast Mon/Tue with *above normal wind power gen expected to follow* mid-to-late next week into early MAR. <u>**The combination of weaker/below normal trending load and increasing/above normal wind power gen by mid-next week should support bearish ERCOT power pricing after near term chaos sorts itself out.**</u>

Paul

**Fig. 1 – Tomorrow's Forecast Surface Chart Across the U.S. and Texas**

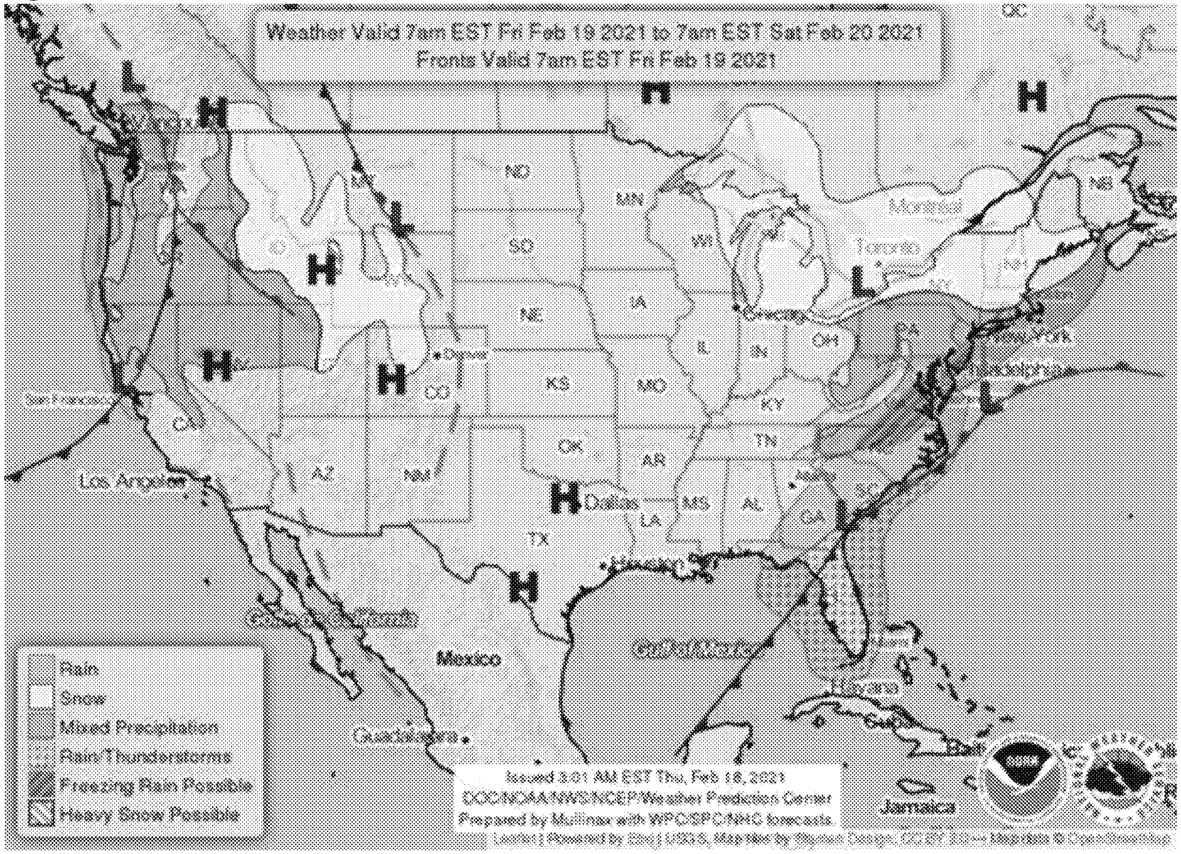



**Fig. 2a – Daily Temperature Anomaly Valid Yesterday, Today and Forward 3 Days (as labeled)**

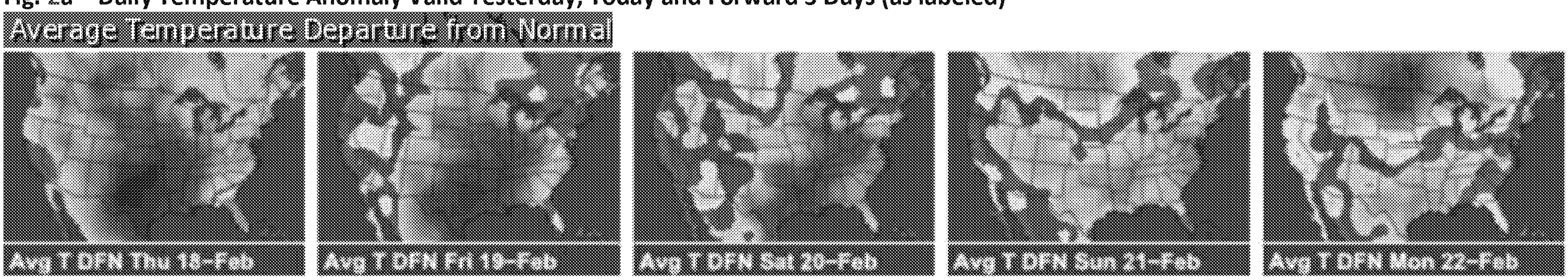


**Fig. 2b – WSI 15-Day Temperature Forecast for Key ERCOT Cities (Colored By Anomaly)**

| ERCOT | | °F Current | Thu (Feb 18) | Fri (Feb 19) | Sat (Feb 20) | Sun (Feb 21) | Mon (Feb 22) | Tue (Feb 23) | Wed (Feb 24) | Thu (Feb 25) | Fri (Feb 26) | Sat (Feb 27) | Sun (Feb 28) | Mon (Mar 1) | Tue (Mar 2) | Wed (Mar 3) | Thu (Mar 4) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ERCOT (Agg) | > | 33 | 25/34 | 21/43 | 24/53 | 41/58 | 37/59 | 38/66 | 49/72 | 54/71 | 48/65 | 46/65 | 51/69 | 51/63 | 48/63 | 45/62 | 43/60 |
| Abilene, TX | > | 24 | 11/28 | 11/43 | 29/55 | 32/53 | 28/58 | 38/67 | 47/75 | 45/66 | 37/57 | 38/64 | 43/63 | 41/56 | 40/58 | 36/54 | 35/56 |
| Austin, TX | > | 30 | 25/32 | 21/41 | 19/51 | 40/54 | 36/55 | 36/63 | 47/70 | 56/74 | 48/66 | 45/62 | 51/69 | 50/63 | 48/62 | 45/64 | 42/61 |
| Camp Mabry, TX | > | 32 | 25/33 | 22/43 | 23/52 | 43/55 | 37/55 | 37/63 | 48/70 | 57/73 | 48/66 | 45/62 | 51/68 | 51/63 | 49/63 | 46/64 | 43/61 |
| Brownsville, TX | > | 40 | 35/43 | 31/56 | 36/67 | 55/72 | 51/65 | 49/71 | 59/78 | 63/77 | 60/75 | 60/77 | 61/79 | 62/77 | 59/74 | 58/72 | 57/71 |
| Corpus Christi, TX | > | 45 | 31/42 | 26/49 | 29/62 | 53/68 | 45/61 | 41/69 | 55/75 | 60/77 | 56/68 | 54/73 | 56/74 | 57/70 | 54/67 | 51/66 | 51/66 |
| DallasFtWorth, TX | > | 30 | 19/30 | 15/38 | 23/48 | 36/55 | 29/59 | 37/65 | 48/73 | 48/66 | 41/59 | 38/61 | 45/62 | 45/57 | 42/57 | 38/55 | 37/55 |
| Galveston, TX | > | 44 | 34/43 | 33/48 | 39/57 | 54/63 | 48/59 | 49/60 | 55/66 | 59/65 | 56/62 | 54/65 | 56/68 | 58/65 | 55/63 | 53/61 | 52/61 |
| Houston, TX | > | 38 | 30/38 | 25/44 | 25/53 | 45/60 | 41/58 | 38/66 | 49/72 | 59/69 | 54/68 | 50/69 | 55/72 | 55/65 | 53/65 | 49/64 | 47/61 |
| Junction, TX | > | 25 | 19/31 | 14/47 | 24/52 | 37/57 | 28/56 | 35/63 | 46/73 | 51/76 | 43/66 | 41/69 | 47/69 | 47/64 | 44/63 | 42/63 | 40/63 |
| Laredo AFB, TX | > | 44 | 32/43 | 27/55 | 30/67 | 49/75 | 48/68 | 46/72 | 57/84 | 60/85 | 59/74 | 55/77 | 58/83 | 62/78 | 58/75 | 55/76 | 54/74 |
| Lufkin, TX | > | 31 | 25/33 | 21/41 | 19/53 | 36/57 | 35/55 | 34/66 | 44/68 | 55/65 | 47/62 | 44/64 | 47/69 | 50/61 | 48/61 | 45/62 | 43/58 |
| Midland, TX | > | 21 | 13/27 | 12/43 | 23/55 | 32/56 | 26/54 | 33/65 | 42/73 | 43/67 | 35/55 | 37/62 | 41/65 | 42/57 | 39/58 | 34/55 | 34/56 |
| Mineral Wells, TX | > | 29 | 16/31 | 10/43 | 23/55 | 33/56 | 27/61 | 35/67 | 47/75 | 45/67 | 38/58 | 37/63 | 43/63 | 42/57 | 39/57 | 35/55 | 34/57 |
| Paris, TX | > | 29 | 16/31 | 12/35 | 16/41 | 32/46 | 27/54 | 32/59 | 43/63 | 44/61 | 38/54 | 35/56 | 42/60 | 42/54 | 38/54 | 34/51 | 34/50 |
| San Angelo, TX | > | 26 | 16/29 | 12/47 | 28/55 | 35/60 | 28/59 | 38/67 | 47/75 | 48/72 | 40/60 | 39/66 | 44/66 | 44/59 | 41/61 | 37/58 | 37/60 |
| San Antonio, TX | > | 31 | 26/35 | 22/46 | 24/54 | 42/61 | 39/61 | 37/67 | 49/71 | 56/76 | 51/71 | 47/64 | 51/71 | 52/67 | 50/65 | 47/66 | 44/64 |
| Tyler, TX | > | 30 | 21/30 | 15/34 | 19/42 | 35/46 | 30/50 | 36/58 | 45/65 | 54/64 | 43/57 | 40/59 | 47/64 | 47/59 | 44/56 | 42/57 | 38/53 |
| Victoria, TX | > | 38 | 27/38 | 23/45 | 22/52 | 46/59 | 40/56 | 36/67 | 50/73 | 58/73 | 52/67 | 50/72 | 56/75 | 56/70 | 53/69 | 50/69 | 49/68 |
| Waco, TX | > | 30 | 22/31 | 15/39 | 20/49 | 39/55 | 32/57 | 36/64 | 48/72 | 52/69 | 44/62 | 41/62 | 47/65 | 47/60 | 44/59 | 41/60 | 38/57 |
| Wichita Falls, TX | > | 25 | 4/29 | 8/39 | 22/49 | 26/47 | 23/57 | 32/64 | 45/67 | 38/58 | 35/56 | 35/60 | 40/60 | 39/53 | 36/55 | 33/52 | 32/55 |

| SB <= -15 | -15 < MB <= -8 | -8 < B <= -5 | -5 < B <= -3 | -3 < Normal < 3 | 3 <= A < 5 | 5 <= A < 8 | 8 <= MA < 15 |
|---|---|---|---|---|---|---|---|

**Fig. 3a – 5-Day Total Precipitation Forecast Valid Thu 2/18 – Mon 2/22**

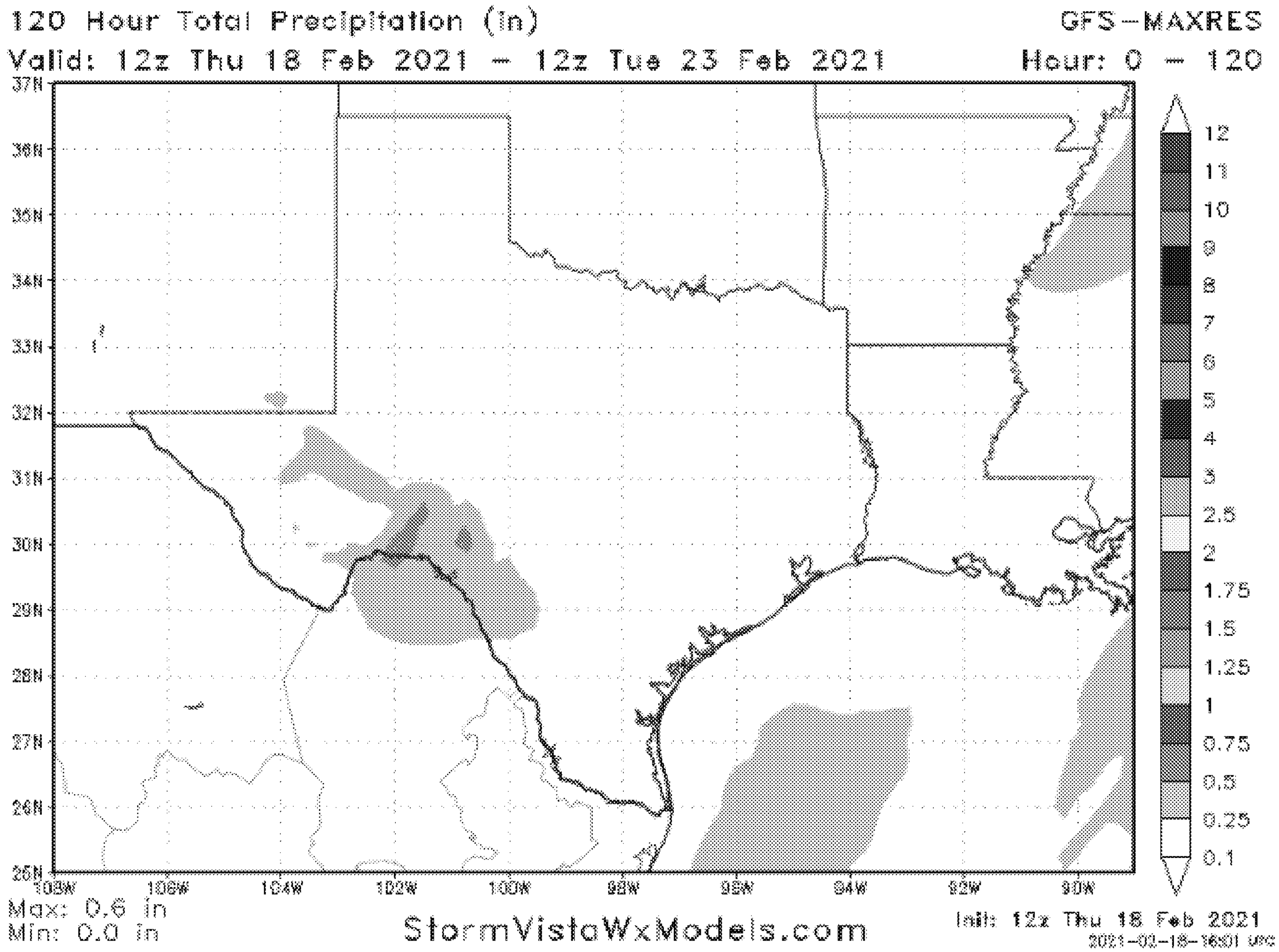
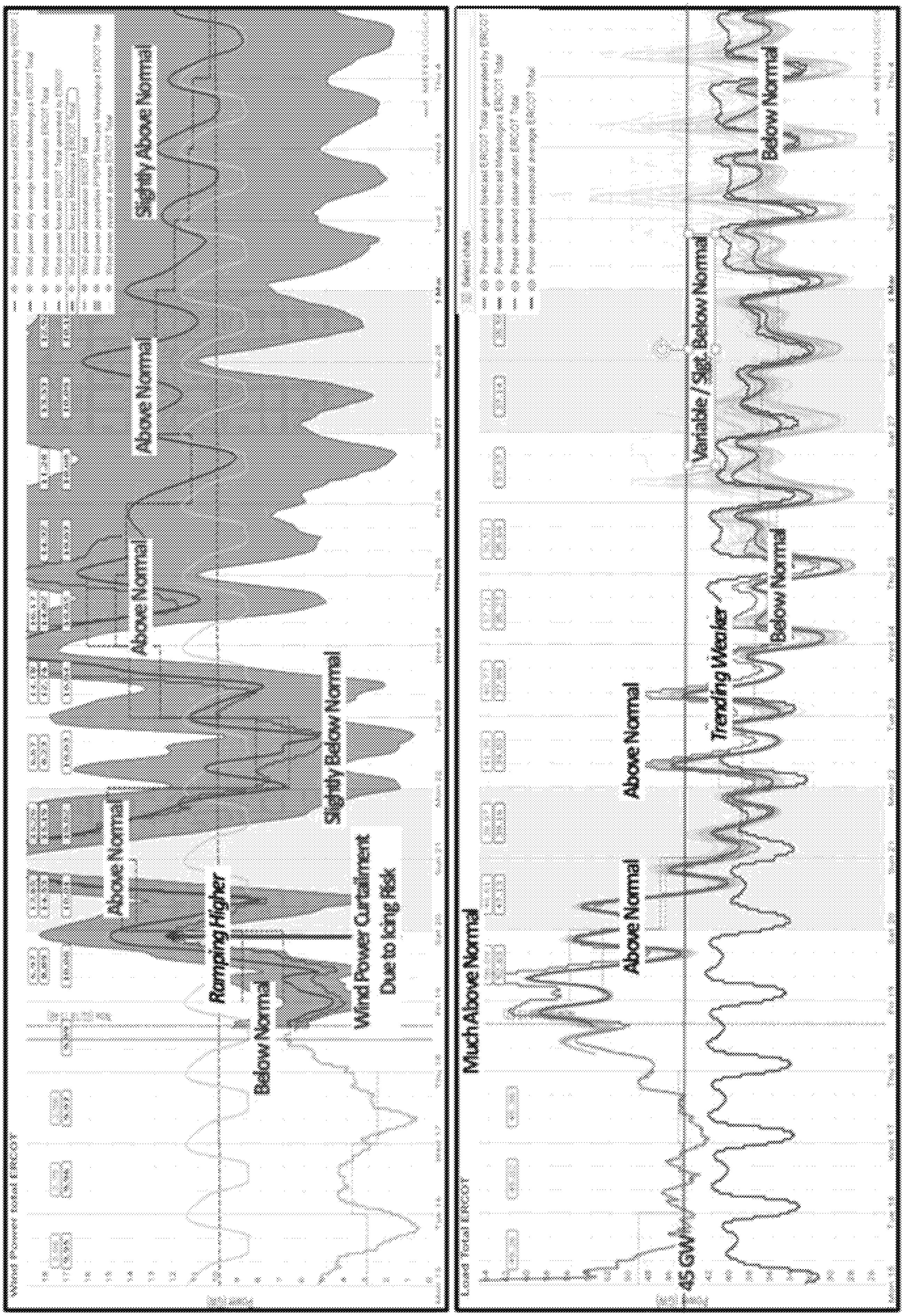



**Fig. 3b – WSI 15-Day Precipitation Probability Forecast for Key ERCOT Cities (Colored By Anomaly)**

| ERCOT | | °F Current | Thu (Feb 18) | Fri (Feb 19) | Sat (Feb 20) | Sun (Feb 21) | Mon (Feb 22) | Tue (Feb 23) | Wed (Feb 24) | Thu (Feb 25) | Fri (Feb 26) | Sat (Feb 27) | Sun (Feb 28) | Mon (Mar 1) | Tue (Mar 2) | Wed (Mar 3) | Thu (Mar 4) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ERCOT (Agg) | > | 33 | 34 | 6 | 7 | 17 | 22 | 5 | 17 | 30 | 23 | 25 | 33 | 46 | 31 | 26 | 21 |
| Abilene, TX | > | 24 | 10 | 7 | 4 | 7 | 4 | 4 | 5 | 14 | 9 | 5 | 15 | 23 | 29 | 18 | 17 |
| Austin, TX | > | 30 | 52 | 7 | 10 | 19 | 15 | 5 | 18 | 29 | 23 | 31 | 37 | 46 | 29 | 23 | 14 |
| Camp Mabry, TX | > | 32 | 55 | 7 | 10 | 17 | 10 | 4 | 19 | 31 | 20 | 23 | 37 | 46 | 31 | 23 | 9 |
| Brownsville, TX | > | 40 | 32 | 2 | 7 | 9 | 41 | 12 | 18 | 23 | 34 | 19 | 23 | 18 | 20 | 18 | 19 |
| Corpus Christi, TX | > | 45 | 19 | 3 | 7 | 9 | 39 | 7 | 17 | 31 | 23 | 19 | 23 | 37 | 23 | 23 | 21 |
| Dallas-FtWorth, TX | > | 30 | 7 | 7 | 7 | 22 | 10 | 4 | 11 | 31 | 17 | 17 | 41 | 52 | 34 | 23 | 23 |
| Galveston, TX | > | 44 | 20 | 5 | 5 | 14 | 44 | 5 | 18 | 35 | 31 | 31 | 29 | 51 | 35 | 32 | 35 |
| Houston, TX | > | 38 | 22 | 5 | 7 | 14 | 41 | 5 | 23 | 40 | 32 | 38 | 31 | 50 | 34 | 34 | 31 |
| Junction, TX | > | 25 | 34 | 5 | 4 | 14 | 5 | 4 | 9 | 11 | 5 | 7 | 29 | 37 | 31 | 20 | 7 |
| Laredo AFB, TX | > | 44 | 8 | 5 | 3 | 7 | 19 | 4 | 7 | 10 | 19 | 12 | 14 | 23 | 14 | 9 | 7 |
| Lufkin, TX | > | 31 | 50 | 10 | 8 | 17 | 47 | 7 | 29 | 42 | 43 | 29 | 43 | 56 | 40 | 39 | 34 |
| Midland, TX | > | 21 | 56 | 7 | 7 | 7 | 4 | 4 | 4 | 4 | 3 | 1 | 4 | 11 | 10 | 4 | 0 |
| Mineral Wells, TX | > | 29 | 7 | 7 | 7 | 7 | 10 | 4 | 11 | 23 | 17 | 8 | 31 | 45 | 34 | 23 | 23 |
| Paris, TX | > | 29 | 14 | 7 | 11 | 31 | 15 | 5 | 14 | 42 | 31 | 20 | 52 | 57 | 38 | 35 | 29 |
| San Angelo, TX | > | 26 | 45 | 7 | 4 | 7 | 5 | 4 | 7 | 7 | 4 | 5 | 18 | 21 | 23 | 18 | 12 |
| San Antonio, TX | > | 31 | 95 | 9 | 5 | 18 | 14 | 5 | 21 | 21 | 19 | 23 | 34 | 45 | 29 | 23 | 14 |
| Tyler, TX | > | 30 | 44 | 7 | 8 | 23 | 39 | 5 | 19 | 40 | 32 | 37 | 48 | 56 | 40 | 37 | 23 |
| Victoria, TX | > | 38 | 14 | 4 | 7 | 17 | 35 | 7 | 22 | 34 | 23 | 23 | 23 | 48 | 23 | 31 | 20 |
| Waco, TX | > | 30 | 37 | 7 | 7 | 22 | 7 | 5 | 14 | 23 | 17 | 20 | 40 | 55 | 37 | 34 | 14 |
| Wichita Falls, TX | > | 25 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 10 | 23 | 9 | 20 | 23 | 39 | 23 | 14 |

< 20 | 20 - 50 | > 50

Fig. 4 – ERCOT Wind Power Generation and ERCOT Load Forecast From Metrological (Blue); ERCOT (Green) and Normal (Yellow)






JPMC-CB_00111501

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